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THE EDITOR'S PAGE

Manuscript Assessment

An important part of the research process is the sharing of results with the scholarly community. One way of doing this is by writing an article for a research journal. Most journals that carry reports of empirical studies tend to use similar evaluative criteria in the assessment of manuscripts. These criteria may be stated in the form of nine questions:

1. Are the conceptualization and rationale of the study apparent?
2. Has previous pertinent literature been cited?
3. Has the continuity between the study and previous work been demonstrated?
4. Are data sources and collection/analysis procedures described and appropriate?
5. Has the trustworthiness of the study been established?
6. Are the conclusions substantiated by the evidence presented?
7. Have the similarities and differences between the results of the study and the work of others been clarified?
8. Have the theoretical, practical, and/or methodological implications been identified?
9. Has the contribution or significance of the study been assessed?

If you are planning to write an article, or are in the process of writing one, keep these questions in mind.

If you have just completed a manuscript and can answer *yes* to each of these questions, then send it to us. Chances are we will publish it.

WHW

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Computer Technology and Education

Realizing the educational potential of computer technology largely depends on developing appropriate policies related to the technology. A policy Delphi methodology was utilized to identify those changes in education which were probable and possible through the continued introduction of computers as well as to identify potential patterns for arriving at a normative (desired) future. Participants in the study panel consisted of 18 individuals with a knowledge of computers and a background in education. Data collection included a pilot study followed by three distinct iterations or rounds. The conclusions emphasize the need for ongoing activity related to policy making especially in areas related to determining educational priorities and strategies for dealing with technological change.

It is generally agreed that computers are the dominant technological artifact of our time. Lepper (1985) reflects the view of numerous writers: "We are currently on the edge of a revolution in technology that may eventually prove more sweeping and significant than any other technological advance in the last 200 years—the revolution that is likely to occur as powerful microcomputers begin to infiltrate our lives" (p. 1). Masuda (1980) describes computer technology as fueling a transformation from an industrial society to an information society. The widespread acquisition of computers by schools is often cited as reflecting this societal transformation. Numerous reports attest to the rapid growth in numbers of computers in the schools of most of the provinces and states (Bork, 1984; Morgan, 1984; Petruk, 1985; Weiner, 1984). Computers have generated a great deal of enthusiasm and excitement as schools continue to acquire them at a rapid rate. Shavelson and Salomon (1985) identify a major reason for these developments: "For the first time, a genuinely 'thinking' interacting technology, the computer, has become readily available to education. . . . The pedagogical promise of the new information technology is boundless" (p. 4).

Despite the large-scale acquisition of computers in schools there is increasing concern that they are having a limited impact on the instructional process (Becker, 1984; Bork, 1984; Ebisch, 1984; Papert, 1979; Shavelson et al., 1984; Sheingold, Kane, & Endreweit, 1983; Weizenbaum, 1979). Two contrasting visions of the potential of computers in education are presented by Kohl (Ebisch, 1984):

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Computers are special, they're not just an electronic version of the same old boring school tools. But they could be used to reinforce the worst practices of schools. . . . The other possibility is that the computer becomes a tool to extend the capabilities of one's mind, a device for modeling possible worlds, for doing scientific simulations, for allowing kids at a very young age to begin to see that you can control variables and understand systems and do these intellectual things visually. (p. 38)

Kohl's more promising pedagogical vision of computer technology will not be achieved easily. Shavelson and Salomon (1985) suggest that: "The impact of the new technology on cognition is not guaranteed. Its impact depends largely on how students and teachers use the new technology" (p. 4). For Lepper (1985), the time for research is now: "Yet it seems critical to examine the larger issues, before this technology becomes such an integral part of our daily lives that it will be, as was the case with commercial television, too late to ask critical questions" (p. 16). Representative of much of the questioning in the area are those questions with a futures orientation. By gaining a clearer vision of the future, asking critical questions, and establishing appropriate policies, we can make better use of this new technology.

Realizing the educational potential of computer technology largely depends on developing appropriate policies relevant to the technology. Dunn (1981, pp. 6-24) establishes that historically there has always been a need for information relevant to policy making. He also observes that the industrial revolution and more recently the advent of a "postindustrial society" have accelerated the need for information relevant to policy making.

A recognized means of generating information relevant to policy making are policy analysis studies. Quade (1975) describes policy analysis as: "any type of analysis that generates and presents information in such a way as to improve the basis for policy makers to exercise their judgment" (p. 4). A commonly used technique in policy analysis studies is forecasting. Dunn (1981) suggests that forecasting techniques are suited for problems related to uncertainty, especially those that are "messy" or "ill structured" (p. 195). This article reports on a study which utilized a forecasting technique known as Policy Delphi.

The purpose of the study was to identify those changes in education, over the next five years, which were both probable and possible through the continued introduction of computers, as well as to identify potential patterns for arriving at a normative (desired) future. As previous studies (Barrington, 1981; Sellinger, 1984) had reported problems related to the Delphi technique, an additional purpose of the study was to further refine the Delphi, particularly in the area of maintaining panelist support. The study clarified some of the immediate concerns related to computing in education as well as exposed future policy options and issues related to a continued introduction of the technology. In addition, it provided a framework for collecting information relevant to policy making.

Methodology

Yeakey (1983) characterized policy as "the culmination of action and inaction of the social system in response to demands made on it" (p. 256). In their definition of policy analysis and policy studies Nagel and Neef (1980) emphasize the importance of the study of alternative policies: "Policy analysis or policy studies can be broadly defined as the study of the nature, causes, and effects of alternative public policies" (p. 15). Dror (1971) also recognizes the importance of studying alternative policies in a future context: "The establishment of explicit alternative futures assumptions, to serve as contexts for concrete policymaking, is an important contribution to the improvement

of policymaking" (p. 70). Stokey and Zeckhauser (1978, p. 22) represent the study of alternative policies as similar to an economic model wherein there is a possibility frontier and decision makers must decide among the alternatives available. On a basic level, they describe it as a "fundamental choice model" that involves two primary elements:

1. Identifying the alternatives open to the decision maker; and
2. Determining his preferences among these alternatives.

The rationale for the study was derived from these and other aspects of the policy literature that relate to establishing policy alternatives. The study first identified alternative futures related to computer technology and education and then explored policy alternatives for achieving a desired future. Essentially, using definitions provided by Dunn (1981, p. 143), it identified those futures that were plausible, potential, and normative, and then identified potential patterns for arriving at a normative future.

The Delphi

A Delphi is an iterative procedure which allows a group of individuals to collectively address complex problems. It is usually future oriented. An essential feature of a Policy Delphi, unlike the more common Conventional Delphi, is that it is designed to explore policy issues and does not strive for consensus. The study involved three distinct iterations or rounds. The first round identified those changes in education which were either probable or possible within the next five years as a result of the continued influence of computers. The second round involved a rating of the desirability and probability of those changes identified as either probable or possible. The third round explored potential patterns for achieving a normative future.

Critical to the success of Delphi studies is the Delphi panel. The Delphi panel was identified through a two-step selection procedure. In the first step, six prominent educators who represented different organizations were selected on the basis of their involvement with computers. After participating in the pilot study and the first round of the Delphi, these individuals were asked to nominate other participants on the basis of supplied criteria. An additional 12 participants were obtained for the study on the basis of nominations received from this nucleus. Hence participants in the study panel consisted of 18 individuals with a knowledge of computers and a background in education. Participation included representation from central office, government departments, industry, in-school personnel, and university. A 100% participation rate was maintained throughout the three rounds of the study. Cost constraints delimited the study to the province of Alberta. However, as at the time of the study Alberta was one of the leading provinces/states in terms of computer-related acquisition and activity (Petruk, 1985), the environment provided a very suitable setting in which to identify futures oriented policy issues and concerns.

Data Collection and Analysis

Data for the study were collected through a preliminary pilot study followed by a three-round Delphi. These data were collected from April 1984 to January 1985. The instrument used in each round of the study was developed on the basis of information collected in the previous phase.

The pilot study consisted of six interviews. These interviews were designed to explore concerns related to the impact of computers on education and help conceptualize the problem to be explored throughout the Delphi technique. Information

obtained in the pilot study was used to develop the Round I instrument.

The purpose of Round I was to identify those developments within education which were either probable or for which there was potential as a result of the continued introduction of computers to education. Data collection in Round I was by way of interview. The interview guide was developed from information obtained in the pilot study as well as the literature. The 18 participants were asked to consider educational computing and then identify the major plausible and potential futures in the following distinct areas: acquisition and funding, courseware, curriculum, organization, and teacher training. In addition to the five areas identified, participants were asked to comment on any other areas they felt were important to the study. Data obtained in the interviews were summarized, categorized, and synthesized in a series of nine steps. This process provided 100 statements about future developments in education as a result of the continued introduction of computers. These statements were used in the development of the Round II questionnaire.

The purpose of Round II was to rate the overall probability and desirability of statements identified in Round I. The questionnaire consisted of the 100 statements about the future which were grouped into the following eight categories: acquisition and funding, courseware/software, curriculum, teacher training, organizations, ethical concerns, equity, and other areas. Participants were asked to rate the probability and desirability of each of the statements. Each questionnaire item required two separate responses wherein the respondent had five choices for each response. The choices related to probability were: highly probable, probable, uncertain, improbable, and highly improbable. The choices related to desirability were: highly desirable, desirable, uncertain, undesirable, and highly undesirable. Analysis procedures related to Round II included reducing these five choices to three categories, a positive, uncertain, and negative. A frequency count was done for each of the items and the information cross-tabulated. A 3x3 matrix was produced for each item on the basis of ratings of probability and desirability. Seven categories were created from the cross-tabulation on the basis of participant rating of probability and desirability. These categories were: (a) Agreement on probability/no agreement on desirability; (b) Agreement on desirability/no agreement on probability; (c) Agreement on probability/no agreement on desirability; (d) Agreement on probability/low desirability; (e) Agreement regarding low desirability/no agreement on probability; (f) Agreement regarding low desirability/improbability; (g) Scattered items. Four of these categories were later used in development of the Round III instrument.

The purpose of Round III was to identify potential patterns for achieving a normative future. A questionnaire was again used for this final round. It consisted of 24 statements which were selected from the original 100 statements used in Round II. These statements were selected from categories identified in Round II. Four categories were selected on the basis of containing information relevant to the purpose of Round III. Each of these four categories was represented in a separate section of the questionnaire. Section I included 16 statements which had been regarded as highly probable as well as highly undesirable. Participants were asked to recommend strategies for reducing the probability of these developments. Section II included four statements which had been regarded as highly desirable with little agreement regarding probability. Participants were asked to recommend strategies for increasing the probability of these developments. Section III included two statements which had been regarded as highly probable with little agreement regarding desirability while Section IV included two statements which had been regarded as highly undesirable with little agreement regarding probability. Participants were also asked to make

specific comments regarding each of the statements in Sections III and IV. Data collected were analyzed through a seven-step procedure which included categorizing, summarizing, and frequency analysis. In addition, participants were asked to consider each of the 24 statements and specify the greatest levels of concern from each of the following: provincial, regional, system, school, and university. Frequency analysis was used to analyze this data.

An additional purpose of the study was a further refinement of the Delphi technique. Design features of the study attempted to address problems identified in earlier studies. Particular attention was devoted to addressing the problem of maintaining panelist support (Barrington, 1981, p. 265; Bright, 1978, p. 42; Sellinger, 1984, p. iv). A 100% participation rate was maintained throughout the study. Major design features of the study which may be attributed to achieving this unusually high participation rate include the following: conducting an interview-based preliminary pilot study, use of an expanding nucleus nomination procedure to select participants, establishing early personal contact with participants through the Round I interviews and maintaining that contact throughout the study, procuring panelist support at the commencement of the study, selective anonymity wherein participants knew the names of other panel members while individual responses remained anonymous, field testing instruments, limited use of the mail system, and minimal turn-around time.

Major Findings of the Study

The study identified a wide variety of developments which were regarded as both probable and desirable. These developments were described as being either a reaction to technological change or part of a continued technological experiment wherein much of the present computer-related activity could be justified on the basis of exploiting a future potential. Developments which were identified as probable and undesirable included: underutilization of equipment, problems related to the allocation of equipment, lack of appropriate courseware/software, piracy, confidentiality of files and information, equity, funding, resistance to change, software and hardware inertia restricting upward capability of hardware, migration of human resources, and increased and conflicting demands on educational organizations. Developments identified as desirable with little agreement regarding probability included: development of a local software industry tailored to provincial curriculum, a strong emphasis on computer-related in-service, an awareness of the social impact of computers, and increased parent involvement in school matters. Major potential patterns for achieving a normative future included: increased courseware/software development and evaluation, increased levels of funding, inservice, a recognition of the need for policies related to educational computing, curricular development, preservice, planning, security procedures, and communication among organizations and stakeholders.

Overall, the Delphi provided useful information for futures oriented planning and policy making. The findings tended to support the view that realizing the educational potential of computer technology will continue to require a great deal of continued activity related to policy making. This activity, while not necessarily uniform, needs to occur at a variety of decision making levels. The following conclusions and implications are presented as considerations for educational policy makers.

Conclusions and Implications

Nine major conclusions regarding developments in computer technology and education are presented below. As Rounds II and III of the study were used to refine information collected in the pilot study and Round I, the conclusions are based primarily on data collected in Rounds II and III. These conclusions begin with the general and move to the more specific. Following each conclusion is a brief discussion of implications. An attempt is also made to incorporate aspects of the literature in the discussion of implications.

1. Computer technology, like other technological developments, has the potential to have positive, negative, or neutral effects on the educational enterprise. The nature of these effects will largely be determined by the actions of educational policy makers. Policy making relevant to computer technology would be vastly improved if we placed more emphasis on determining our educational preferences and priorities.

In addition to identifying benefits, the study identified a number of potential negative outcomes related to the impact of computer technology on education. This finding suggests that viewing computers as a panacea for all that ails education has the potential to do much harm. A critical role for policy makers is to ask questions related to the negative effects of computer technology. More importantly, meaningful computer-related changes must be founded on substantial values if they are to be of lasting worth to education. In this context, computers may be viewed primarily as a catalyst, and the major question is not what should we do with computers but rather: What should we be doing in education?

2. There will be a continued commitment to computer technology. This commitment will be reflected in a continuation of computer-related activities at all grade levels. Much of this activity will be justified on the basis of a general technological experiment. Policy makers will continue to assume that computers will improve educational practice. This improvement will be viewed as taking place within the existing educational structure.

A continued commitment to computer technology will consume a large amount of human and financial resources. Despite this commitment, the findings of this study and the literature (Bork, 1984, p. 242; Shavelson et al., 1984, p. 30; Sheingold, Kane, & Endrewit, 1983, p. 431) express a concern that computer technology is having a limited impact on the instructional process. Clearly, a major challenge lies in further exploiting the potential of computers in education. Exploiting this potential will involve further experimentation, but much of this experimentation will be of little worth unless there is a mechanism for identifying, communicating, and implementing those activities which are truly beneficial to education. Also, while experimentation is necessary, it is inevitable that attempts will be made to use computers for activities for which they are inappropriate. In the process of experimentation a critical question that educators must ask is one posed by Fullan (1982): "Can rejecting a proposed educational program be more progressive than accepting it?" (p. iv). Given the massive amount of resources devoted to computer technology, this question should also be asked on a broader, macro level. If future computers are truly capable of delivering what they promise in terms of ease of human interface, they will be, as Weizenbaum (Ebisch, 1984, p. 36) suggests, nearly transparent. If this is the case, and computers do indeed become so transparent that we need very little knowledge to actually use them, many of the resources presently being devoted to computer technology are not necessary. There is a possibility that many present-day computer-related activities might soon be described as paralleling the Sputnik phenomenon where there was a race to

train individuals in areas for which society later had very little demand.

3. Technological change is inevitable. A commitment to technology in education is a commitment to ongoing change. Change will occur as an ongoing continuous process. Rapid technological developments will further compound problems related to change in education. All educational organizations will experience changes precipitated by computer technology.

While meaningful computer-related change is possible, realizing the potential of computers largely depends on developing appropriate strategies for dealing with change. "One-shot" acquisition of equipment or "one-shot" inservice will not suffice. The rapidly changing technology requires strategies that are ongoing, especially in areas related to acquisition, curriculum, and teacher training. In this regard Fullan's (1985, p. 392) notion that change is a process is reinforced by Uhlig (1983) in the area of technology: "Technological literacy, unlike some other kinds of literacies, is not an event; it is a continuous process" (p. 2). Key issues for policy makers to address in relation to the "race" with technology is whether we are playing "keep up," "catch up," or if we should even be in the "race." Developing strategies to deal with the rapid process of change presents a mammoth challenge. It is likely that the technological capability to produce new and innovative computer devices will continue to be far ahead of our ability to use them in education. Somewhat illustrative of this problem are the many conferences related to computers in education which often more closely resemble an industry "show and tell" more so than they represent any meaningful dialogue related to pedagogy. Mumford and Sackman (1975) suggest: "Society should deliberately lead and direct the application of computers in the image of its most cherished values and ideals rather than be the unwitting victims of the vagaries of technology and the fluctuations of the market-place" (p. v). What is required from policy makers is a focus upon developing a clearer philosophy of technology.

Resistance to change is often cited as a major problem facing the implementation of computer technology. Ironically, the technology itself will foster its own resistance to change as it creates problems related to the "saber-tooth" curriculum (Peddiwell, 1939). For example, sunk costs in software, hardware, or training may mean that educational organizations as well as individuals have a vested interest in maintaining certain learning environments. Given that much of the recently acquired equipment is of an older generation, policy makers should address the following questions: Has much of the recent activity, aimed primarily at acquiring large numbers of computers, been inappropriate? Have we already installed a base which will be resistant to further technological change? Has there been an error in identifying the problem related to computers in education as being primarily one of acquisition?

4. Computer technology will provide the impetus to ask basic pedagogical questions related to curriculum and teacher training. There will be continued experimentation related to the organization and dissemination of knowledge.

This conclusion suggests that computer technology will provide a powerful impetus to ask questions fundamental to curriculum, including a reconceptualization of both knowledge and the delivery of instruction. Such a reconceptualization will also involve a change in the role of the teacher and will be reflected in teacher training programs. These developments have the potential to profoundly affect education in the long term.

5. Most changes related to computer technology will be external to the learning process. While there will be widespread experimentation, basic curriculum content will remain unchanged. Areas such as business education and computing science will continue to assimilate the technology.

There are two major implications, representing opposite scenarios, related to this conclusion. The first is that meaningful change takes place over time and the next five years will continue to be an assimilation period whereby technology follows the path of least resistance while at the same time improving existing technologies and practices. These activities will continue to be viewed as providing a foundation for realizing a much greater potential some time in the distant future. Such an interpretation justifies much of the current computer-related activity on the basis of a general technological experiment. The second implication of this conclusion is that organizations may be avoiding meaningful changes through the assimilation of technology (Sheingold, Kane, & Endrewit, 1983, p. 431). If the technology is being assimilated and little meaningful change is actually occurring, a tremendous amount of resources are currently being wasted.

Somewhat related to this conclusion is the ongoing implication of attempting to cope with the myth and the reality of computer technology. First, expectations often far exceed the reality of what the technology can deliver. Second, without adequate consideration for the realities of the change process, there is no guarantee that the pedagogical applications, which are possible in theory, will automatically find their way to educational practice. Decisions that continue to be based on the myth will inevitably lead to disillusionment.

6. Developments related to computer technology will place increased demands on teachers. These demands will be reflected in increased preservice and inservice activity. The teacher's role will gradually begin to change from a disseminator of knowledge to a facilitator of learning.

Charters and Pellegrin (1972) cite as one of the major problems related to educational change: "The failure to recognize the severity of role overload among members of the instructional staff when innovation is attempted" (p. 12). The findings of the study identified computer technology as contributing to role overload among teachers. Policy makers need first to recognize that this overload exists and then incorporate strategies to deal with it when developing policies related to computer technology and education.

7. All educational organizations will be required to make decisions and establish policies related to computer technology. Many of these decisions will be made at the school, system, and provincial levels. While there is a need for policy at all levels, decisions made at the school level will have the most significant impact regarding the effective utilization of computer technology. Policies will be established both through action and inaction inasmuch as organizations that do not respond to the changing technological environment will be establishing policies through their omission.

It is of critical importance that policy makers recognize the importance of the institutional setting of the school with regard to the use of computers. The findings of the study and the literature on change suggest that successful adaptation of an innovation largely depends on activities at the school level. Berman (1980) provides additional insight related to the implications of this conclusion for policy development: "once policy makers dispense with the image that implementation must be uniform for all policy situations, invariable over time, and homogeneous across organizational levels, they can search for matching, mixing, and switching strategies to improve policy performance" (p. 222).

8. Continued efforts at realizing the potential of computers will create a number of issues and problems for policy makers. The study identified the following major problems as requiring consideration: (a) underutilization of equipment, (b) al-

location of equipment, (c) lack of appropriate courseware/software, (d) piracy, (e) confidentiality of files and information, (f) equity, (g) funding, (h) resistance to change, (i) software and hardware inertia restricting upward capability of hardware, (j) migration of human resources, (k) increased and conflicting demands on educational organizations.

Each of the problems is discussed separately below.

Underutilization of Equipment

A general public support for computers, compounded with generous funding allocations, has resulted in the recent acquisition of a great deal of computing equipment. Much of this newly acquired equipment will be underutilized. This underutilization may occur at two levels. First, machines that have been acquired to take advantage of existing grants may see limited physical use. Second, because machines see maximum physical use does not mean that they are being properly utilized. For example, there has been concern over the misuse of games and drills and practice activities (Shavelson et al., 1984, p. 31; Sheingold, Kane, & Endrewit, 1983, p. 427). Given the large amount of resources being devoted to computers in education there may occur a negative backlash of support for computers should the perception increase that computers are not being properly utilized and that some of the resources could be better devoted to other activities. Large-scale acquisition and widespread physical use of the machines does not guarantee that the potential of computers in education will be realized.

Allocation of Equipment

Computers are being acquired at a rapid rate. They are presently housed in a variety of configurations and used at all grade levels. A major issue is how to allocate equipment in order to maximize benefits from its use. As Peterson (1984) observes, equal distribution is fair and simple; however it often does not provide the critical mass necessary for "ideas and creativity to take off" (pp. 11-12). Configurations such as labs may provide a sense of fairness as well as the necessary critical mass; however, they have the disadvantage of portraying computers as something separate and apart from the curriculum. While increased acquisition will undoubtedly alleviate some of the problems related to access it will also create new ones. For example, as newer generation equipment is acquired who will get access to it? Administrators? Innovative teachers? Designated grade levels or subject levels? Will older generation or underutilized equipment be passed on to less than enthusiastic recipients or merely placed in storerooms? Policies regarding equipment allocation as well as migration will have to be established.

Lack of Appropriate Courseware/Software

Both the findings of this study and much of the literature (Alberta Education, 1983, pp. 57-58; Bork, 1984, p. 240; Komoski, 1984, p. 247; Rockman, White, & Rampey, 1983, p. 42; Sheingold, Kane, & Endrewit, 1983, p. 429) strongly suggest that lack of appropriate courseware/software is a major area of concern. This problem has been magnified by policies allowing the large scale acquisition of computers. Large scale acquisition, without adequate consideration for applications, often results in the use of inappropriate software programs simply because they are readily available. The problem of selecting appropriate courseware/software is further compounded by the extremely high ratio of poor quality programs being marketed for use in education.

Piracy

Lack of appropriate courseware/software, high costs, inadequate funding, the need for multiple copies of a program, and inadequate copyright laws will all contribute to problems related to piracy. This problem will further reduce the development of quality courseware/software when developers do not receive fair compensation for their efforts. A further problem, in major conflict with a fundamental goal of the educational enterprise, is that students who witness acts of piracy are being encouraged, through example, to participate in activities that are dishonest and illegal.

Confidentiality of Files and Information

The increased reliance on computers, especially in tasks related to administration, will create problems related to confidentiality of information. These problems will be further compounded by the increased use of computing networks. Two major areas that will have to be dealt with are those related to unauthorized access and the establishment of policies related to access.

Equity

Computer technology has the potential to remove some of the problems related to equity. For example, improvements in networking and storage capabilities will allow smaller schools to increase their level of service. However, there are also problems associated with the equity issue. Two major dimensions of the issue are actual physical access to computers, and applications to which students are exposed. Not all school districts are adopting computers at a similar rate; consequently, this will lead to problems for students who do not have a background in computing, particularly those who enter postsecondary institutions. Should problems related to equality of access be overcome, it will not necessarily lead to equality of opportunity. Decisions related to the allocation and configuration of equipment, as well as how computers are used for instruction, will vary within districts, schools, and classrooms. There is also concern that individuals from higher social class and boys are receiving the most benefit from computer instruction. If computers really do make a difference in education, then policies that further address the problem of equity are required.

Funding

A substantial amount of funds have already been allocated to educational computing, a large portion of which has been designated for the acquisition of equipment. A commitment to technology requires a further significant ongoing commitment of funds in areas such as the acquisition of new equipment, courseware/software development and acquisition, curriculum, and teacher training. Related to this issue is the problem of obtaining significant levels of funding accompanied with questions related to whether it is worth allocating funds for computing that might be better directed to other areas. Theoretical speculation about the pedagogical promise of this technology is widespread. However there is comparatively little literature which addresses the financial cost of realizing this promise.

Resistance to Change

Computer technology, like other innovations, will meet resistance to change. Fullan (1985) describes attempts at initiating change as "a complex dilemma-ridden, technical, sociopolitical process" (p. 391). There is the constant problem of technology having limited impact on schools, or as Sheingold, Kane, and Endreweit (1983)

concluded in their study, "The study more strikingly illustrates the assimilation of technology by school systems than the impact of technology on them" (p. 431). Policymakers must be prepared to deal with the complexities of initiating change. Fundamental to the development of policy (Berman & McLaughlin, 1976) is that it be "concerned with more than the mere adoption of change agent projects," and take into account "the critical significance of the institutional setting" (p. 347).

Software and Hardware Inertia Restricting

Upward Capability of Hardware

Continued new developments in technology will make further change inevitable. Sunk costs in areas such as hardware, courseware/software, and training may act to reduce an organization's capacity to further adapt to change. For example, an organization with a large investment in existing hardware and software may resist opportunities to adapt to new generation equipment which requires a significant departure from what already exists. Papert (1979) describes an additional dimension of this problem when he portrays existing computer-related practices as sharing "a model of education which leads them to reinforce traditional educational structures and thus play a reactionary role, opposing the emergence of radically new forms of education" (p. 74). Policies are required which reflect the long term nature of computer-related change.

Migration of Human Resources

Many talented, knowledgeable people in the area of computing will leave education. Some of these individuals will pursue careers in business and industry while others will simply burn out. Many other successful computing teachers will also migrate to administrative positions. Policies are required that address the problem of retaining those individuals who can make a positive contribution to education. These policies would also address the problem of role overload and burn out.

Increased and Conflicting Demands on Educational Organizations

Computers have simultaneously been presented as a panacea for all that ails education and as having limited significant impact. Kohl (Ebisch, 1984) describes them as having the potential to reinforce the "worst practices of schools" or become a "tool to extend the capacities of ones mind" (p. 38). They have also been presented as having little impact on the instructional process (Bork, 1984, p. 242; Shavelson et al., 1984, p. 30; Sheingold, Kane, & Endrewit, 1983, p. 431) yet potentially fostering revolutionary changes in curriculum (Henchey, 1982, p. 13; Papert, 1980, p. 140) and teacher training (Alberta Education, 1983, p. 36; Friedman, 1983, p. 16). Weizenbaum (Ebisch, 1984) presents computers as "a powerful distraction that will leave the original problems—money, teachers, time, and energy—untouched" (p. 36). Conflicting viewpoints such as these will increasingly be reflected through demands placed on educational organizations. This problem will be compounded by rapid changes in the actual technology. Policy makers will have to continue to address the role of computers in education.

9. Major potential patterns or strategies for policy makers to consider when dealing with the impact of computer technology include the following: increased software/courseware development and evaluation, increased levels of funding, in-service, a recognition of the need for policies related to educational computing, curricular development, preservice, planning, security procedures, and communication among organizations and stakeholders.

Much of the recent activity related to educational computing has been directed at acquisition. However, as this technology continues to place increased and conflicting demands on educational organizations, policy makers must recognize the need for further policy development. Enhanced communication and dialogue for the purpose of establishing policies relevant to technology, will become increasingly necessary. Rapid change, precipitated largely by technology, makes the development of ongoing strategies an essential activity of educational organizations. Realizing the educational potential of computers, in addition to requiring strategies that address technical issues, requires strategies that address people-oriented issues. Developing these strategies will require a huge amount of resources.

Contribution to the Study

Decision makers have always required information relevant to policy making. An important aspect of policy making is the establishment of alternative futures to serve as contexts for policy making. The rapidly changing technological environment, precipitated largely by the advent of the computer, has accelerated the need for information relevant to policy making. The study provided information relevant to educational policy making by clarifying some of the immediate concerns related to computers in education as well as exposing future policy options and issues related to a continued introduction of the technology. It also illustrated that computer technology is not a panacea for all that ails education and is more appropriately viewed as a catalyst for basic philosophical questions related to the general role of technology, change, curriculum, and teacher training. Finally, it emphasized that we have to have a clear vision of our educational priorities before we can begin to seriously address questions related to what to do with computer technology.

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Drafting and Revising Processes in Grade 12 Students' Examination Writing

The relationships between the quality of writing on composition examinations and topic selection, outlining, rough drafting, and revision were investigated using a sample of 1,372 grade 12 students' essays. Significant relationships were shown between the essay topic selected from a number of topics and the score obtained, and between the use of an outline and rough draft together and the score obtained. Qualitative analysis of revisions suggests a qualitative difference relative to score for some revision categories, particularly stylistic and rhetorical. For every 1,000 words of rough draft, students average approximately 70 revisions in their final drafts. Weaker students revise as much as abler students and across the same revision categories. The purpose of all revising undertaken by senior high student writers can be established in one of six categories: mechanical, lexical, syntactic, stylistic, figurative, or rhetorical.

Writing research (Britton, 1975; Christensen, 1967; Hunt, 1965, 1970; Mellon, 1969; O'Hare, 1973) and much theory (Britton, 1970; Diederich, 1974; Kinneavy, 1971; Moffet, 1968) have tended to concentrate on the writing process from a maturational or evaluative rather than a taxonomic perspective; that is, attempts have been made to show the differences in writing among various age groups, or to show the types of errors students make in their writing. However, the writing process itself has not been fully described categorically—it may never be—nor has the classification of the components of the process been completely examined empirically for its message to teachers of composition.

In 1975, at the Conference on Describing Writing and Measuring Growth in Writing, the following questions were asked (Odell & Cooper, 1977, p. vi):

1. When we describe writing and measure students' growth in writing, what should we look at? Should we examine only the written product? Should we examine the process or strategies which generate that product? In either case, what facets of the product, what aspects of the process should we examine when we describe/measure so complex a thing as growth in writing?
2. How can we find out how well an individual performs at a certain stage in his or her development as a writer? To ask it another way: *How can we determine precisely what a writer is doing and not doing so that we can plan efficient, focused instruction?* [Italics added]

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3. How can we measure growth in writing over a period of time?
4. How can we involve students in the evaluation of writing?

Researchers have already made considerable strides toward answering several of the above questions. For example, in answer to Question 3, and the first part of Question 2, Hunt, in his research on early and late blooming syntactic structures (Odell & Cooper, 1977), has shown that certain syntactic structures do not appear in the writing of students before certain age levels. Others (Mellon, 1975; O'Donnell, 1976; O'Hare, 1973) have demonstrated that particular instruction, especially in sentence-combining techniques, will increase the early use of some syntactic structures significantly. Longitudinal studies to assess the lasting effects of such instruction have yet to be conducted, and the entire question of the quality of writing as it relates to the use of certain syntactic structures has yet to be fully assessed (cf. Dunn, 1983).

Odell (Odell & Cooper, 1977) raises the questions: How do we identify the intellectual processes implicit in students' writing? How do we determine whether students are using these processes as fully and effectively as they might? He observes further that

If we want to make useful diagnoses or formative evaluations of student writing—that is, if descriptions of students' present writing are to be used in helping them improve subsequent writing—we must have some insight into their use of these processes. In making this claim I am assuming that: (1) Although thinking is a complex activity, the number of conscious mental activities involved in thinking may not be infinite . . . (2) *We can identify linguistic cues—special features of the surface structure of written or spoken language—that will help us determine what intellectual processes a writer is using.* (3) In order to improve students' writing, we will have to determine what intellectual processes we want students to begin using, continue using, or use differently; *to make this determination, we must have a good sense of how they are presently functioning.* (p. 108, italics added)

The research of Hunt (1965, 1970) with regard to when and how students use certain syntactic structures has provided some of the insights sought by Odell. The research in this study, which elaborates further on the writing processes of students, examines, in answer to the first two questions posed by Odell and Cooper above, a written product, specifically composition examinations at the grade 12 level; it examines that product in an attempt to ascertain what writers appear to be doing in starting and revising their work, that is, in making choices, and in identifying the types of choices made. It addresses Odell's questions: (a) How do we identify the intellectual processes implicit in students' writing? (b) Are there linguistic categories present in the surface structure of student compositions that help identify the intellectual processes used by the writers? (c) If there are, will knowledge of these assist teachers in improving students' writing?

In 1978, the provincial English Written Composition Achievement Test was administered to 12,695 grade 12 students in the province of Alberta. The students were directed to choose one topic from six provided; space for rough work, suggestions for writing, and categories for scoring the finished work were given in the examination booklet.¹ The compositions were scored holistically on a four-point scale by marking teams composed of Alberta English teachers under the direction of Alberta Education and university and school system supervisory personnel. All markers had undergone earlier workshop sessions in holistic scoring procedures.

The research takes its point of departure from a pilot study done by Emig (1971, p. 25) who examined the assumption that student writers, first of all, do outline and, secondly, that outlining prior to composing results in writing of superior organization.

Both writing an outline and writing a rough draft have been advocated by teachers as the route to quality composition. The Alberta Composition Achievement Test booklets, for example, provide identified space for such work.

The Emig study, based upon 109 expository themes written by 25, high-honors, grade 11 English students during an eight-week period, identifies approximately 37% of the themes as preplanned in any fashion, and only 8% of the themes as formally outlined. Emig found no correlation between the presence or absence of an outline, formal or otherwise, and the grades received. She also found, in questioning professional and academic writers, that there was "a great diversity and individuality" in their writing practices. Do these findings hold true for compositions written under test conditions where revision of a rough draft, if not explicitly required, is at least implied by the space provided? Is there a significant diversity in the revision practices of students relative to the quality of their writing? And, ultimately, the question remaining is: Does writing activity such as outlining and preparation and revision of a rough draft result in improved writing or not? Is it a useful activity for some students more than for others, or does it matter with some topics more than with others?

Purpose

This study reexamines both Emig's (1971) conclusion with respect to the use of the outline and the widely held assumption that writing a rough draft and carrying out extensive revisions on it results in superior writing. The changes which occur between the rough draft and final composition of meritorious papers, those scored 4, as compared to the changes which occur on papers of lesser merit, those scored 1, 2, or 3 are analyzed. As opposed to discussion of writing maturity or composition evaluation per se, the research is directed primarily toward classification and description, based on an examination of some of the characteristics of the product, which might affect the process leading to quality composition. The research attempts to further our understanding of the writing process in answer to the basic question posed by Odell (Odell & Cooper, 1977) cited above: *How can we determine precisely what a writer is doing and not doing so that we can plan efficient, focused instruction?*

An additional task of this study is to examine the significance of topic selection (Table 1) on the quality of the final composition. Also, to accompany the quantitative analysis of the above factors, a qualitative analysis is attempted to determine what, if any, substantive differences exist in the changes made between rough draft and final composition on 4-score papers as compared to those made on an equal subsampling of 1-, 2-, and 3-score papers.

In summary, the problems investigated may be stated as follows:

1. Do student compositions which utilize an outline and/or a rough draft rank higher by teacher evaluation than those which do not?
2. What revision occurs between a rough draft and a final draft on essay tests, for what purposes, and does this revision differ substantively with respect to high and low scored essays?
3. Does the selection of a topic from a number of topics affect the type of revisions made between a rough draft and a final draft on essay tests, and, if so, how? Does topic selection affect the final score, and, if so, how?

TABLE 1
Theme Topics

Topic 1	The most important freedom is the freedom to pursue one's dreams.
Topic 2	Modern society treats young people and old people in the same ways.
Topic 3	Money and material goods are not necessarily the measures of success and happiness.
Topic 4	Nature in Alberta expresses itself in beautiful extremes.
Topic 5	Young people should have a greater say in government for it is their future that is being shaped.
Topic 6	It is a myth that young people are rebellious. They are, in fact, of any group, the most docile and the most resistant to change.

Method

Several hypotheses were established against which to test the questions addressed in this study:

1. Where a choice of topics is offered, the topic selected for an essay does not bear a significant relationship to the score obtained.
2. The type and amount of revision between rough draft and finished composition are not significantly related to the topic chosen.
3. Students who employ an outline and/or a rough draft do not score significantly higher on their essays than those who do not use an outline and/or a rough draft.
4. The amount of revision from rough draft to finished product in each revision category is not significantly related to the quality of the finished composition.

To assist in the investigation of these hypotheses, a series of questions was set:

1. How many papers in the sample were written on each theme and what scores did they obtain?
2. How many papers in the sample use an outline only, formal or informal, and what scores did they obtain?
3. How many papers in the sample use a rough draft only, and what scores did they obtain?
4. How many papers in the sample use both an outline and a rough draft, and what scores did they obtain?
5. How many papers in the sample use neither an outline nor a rough draft, and what scores did they obtain?
6. What are the categories of revision used by students in making changes between rough and final drafts?
7. What is the frequency of revision in each category for each score and each topic?

As well, three questions were asked relative to the quality of prewriting activities:

1. Is there a qualitative difference in the information load of the topics offered?
2. Is there a qualitative difference in the outlining and rough drafting processes used by students?
3. Is there a qualitative difference in the revisions for each category relative to score?

An outline was defined as “any schema related to the composition of the theme, prior to the theme (informal) . . .; numbers or letters may precede the items, and there may be at least one level of indentation (formal)” (Emig, 1971, pp. 26-27).

A rough draft was defined as all written material, excluding any outlining, which the student produced (and submitted) exclusive of the final copy. This usually included all material on the left-hand side of the examination booklet pages in the “rough work” space, as well as any interlinear changes, additions, or deletions that might have been made to that rough draft writing during or after its initial composing process. Hence “revision changes” to the rough draft are only those differences between it and the final copy written on the right-hand side of the booklet in the “finished work” space.

In a very few instances, due either to time constraints or to the student’s intention to write only one draft, only one copy was produced either on the left- or right-hand side of the booklet. In these cases, since the score is based on the single copy as if it were a final draft, the writing was treated as final draft without a rough draft. Word counts, based on the number of words in the rough draft, do not include these papers; nor, of course, do these papers provide any revision counts.

The sample was analyzed first for answers to questions one through five above. These data are reported in Table 2. A dozen papers, three from each score, were analyzed to determine the revision categories which students used in making changes between their rough and final drafts. These categories, based on the *purpose* of the revision, were identified as mechanical, lexical, syntactic, stylistic, figurative, and rhetorical. The categories were further refined as the specifics of each were established through use by the researcher. For example, if one word replaced another to change the meaning, it was coded as a lexical revision. If the same word change constitutes a synonym replacement to reduce repetition, the revision was categorized as a stylistic change.

In addition to mechanical revisions (Eley, 1953), three categories (lexical, syntactic, rhetorical), established by Emig (1971), have been utilized. In each case, the original definitions have been adjusted somewhat to accommodate the data. Also, two categories, stylistic and figurative, were added to accommodate these reasons for revisions which were found in the student compositions. It should be noted that the categories, while still not mutually exclusive in some instances, have been found adequate to accommodate all types of revisions discovered in the sample. Moreover, these categories have been found to distinguish the more specific revisions identified as mechanical, lexical, and syntactic from changes which appear to have much more to do with quality of thought; that is, stylistic, figurative, and rhetorical. In the former instances, revisions more often involve correctness and/or appropriateness of text; in the latter, the revisions reflect to a greater extent audience awareness on the part of the writer. In this respect, these latter changes frequently require much more rewriting than do the former and, it would appear, much more thought on the part of the writer about the revision.

Finally, the six categories are, to some extent, hierarchical. Revisions that might be classified as syntactic in nature frequently involve changes in level, specificity, and so on, as well, in such cases, the revisions are classified according to the “highest” category represented by each change and recorded only once. For example, in the rough draft, a student wrote

They also think that it is going to restrict their freedom by having to take care of an old person.

In the final draft, this sentence was changed to

They also think that it is going to restrict their freedom by having an old person under foot all the time.

The revision is syntactic in that the relationship of the parts is affected, the verbal being replaced by a noun. However, the revision is also figurative; the concept has been expanded, cliché notwithstanding—in this instance by use of a figure of speech—thereby increasing its concreteness. (It might also be argued that a change in style has also been effected.) The revision is categorized once as figurative, however, it being the “higher” category represented by the change.

The categories for analysis of revision and their descriptors are listed here in hierarchical order:

1. *Mechanical*—changes between rough and final draft which involve a *correction*. These changes might include punctuation, spelling, agreement, tense, and capitalization changes; changes from abbreviated or contracted forms to nonabbreviated or noncontracted forms; for example, “#” to “number,” “isn’t” to “is not.”
 Note 1: not all punctuation changes are mechanical; use of the hyphen, for example, for clarifying modification (e.g., red brick house/red-brick house), or punctuation to eliminate fragments or run-on sentences are syntactic revisions.
 Note 2: changes which involve use of recognized acronyms such as NATO are mechanical; however, changes from such abbreviations to their full form in the final draft are classified as stylistic.
 Note 3: transcription errors, since they do not indicate a conscious revision made by the student upon the text, are not counted.
2. *Lexical*—changes between rough and final draft *from or to a single word for denotation purposes only*.
 Note 1: connotative changes are classified as stylistic changes, for example, politician/statesman.
 Note 2: level changes are classified as stylistic changes; for example, told/informed.
3. *Syntactic*—changes between rough and final draft, *within the sentence only, affecting the relationship between the syntactic parts*; that is, changing a word to a phrase, a phrase to a clause, predication, subordination, modification, and coordination.
4. *Stylistic*—changes between rough and final draft including connotation, voice, level, and clause inversion which *paraphrase or are optional in nature*.
 Note: stylistic revisions might be considered as microrhetorical changes.
5. *Figurative*—changes between rough and final draft, which may go beyond the sentence boundary, *to increase or decrease the specificity, concreteness, generality, or abstraction of the text*.
 Note: these revisions may be considered an expansion on the original text; that is, additional modification of a term which is already modified, or additional sentences to expand a concept and thereby increase its specificity and/or concreteness.
6. *Rhetorical*—changes between rough and final draft, which almost always go beyond the sentence, *to manipulate the reader*; that is, sentence type changes such as declarative to interrogative, beginning new paragraphs, underlining for emphasis, reordering sentences, and adding sentences which emphasize rather than expand upon a concept.

A number of questions, based on the category descriptors and examples discovered in the compositions, were developed to standardize classification of the revisions made between rough and final drafts. These questions are not intended to be exhaustive of all the possibilities for revisions which might occur between the two drafts, but merely to reflect the type of changes assigned to each revision category.

1. *Mechanical*—Does the revision:
 - a. correct a punctuation error?
 - b. correct a spelling error?
 - c. correct an agreement error?
 - d. correct a tense error?
 - e. correct a capitalization error?
 - f. transcribe an abbreviation, contraction, or number in full?
 - g. reduce a series of words to a common acronym?
2. *Lexical*—Does the revision involve a change in the denotative meaning of a word?
3. *Syntactic*—Does the revision:
 - a. affect the syntactic relationship of the sentence parts?
 - b. introduce (or eliminate) modification in cases where the item, before (or after) the change, is unmodified?
 - c. introduce a word for a phrase or clause, or vice versa?
 - d. introduce a phrase for a clause, or vice versa?
 - e. subordinate a previously coordinated part of the sentence, or vice versa?
 - f. subordinate or coordinate one sentence to another?
 - g. punctuate to eliminate sentence fragments and run-ons?
4. *Stylistic*—Does the revision:
 - a. paraphrase the rough draft version?
 - b. offer an optional version of which a judgment of better or worse might be made?
 - c. switch from active to passive voice, or vice versa?
 - d. increase or decrease the stylistic level?
 - e. invert text within the sentence?
 - f. reduce (or introduce) repetition for effect?
 - g. change the auxiliary verb?
 - h. replace an acronym with its full form?
 - i. involve a shift in connotation only?
 - j. switch person, or noun/pronoun?
5. *Figurative*—Does the revision:
 - a. increase/decrease specificity, concreteness?
 - b. increase/decrease modification of previously modified text?
 - c. increase/decrease text to expand upon/reduce a concept (thereby increasing/decreasing specificity or concreteness).
6. *Rhetorical*—Does the revision:
 - a. manipulate the reader?
 - b. switch to the conditional mood?
 - c. switch the type of sentence, for example, declarative to interrogative?

- d. reorder sentences?
- e. begin a new paragraph or cancel one?
- f. introduce underlining for emphasis?
- g. add (or subtract) sentences, without expanding (or reducing) the concept, to emphasize (or de-emphasize) a point?

A subsample of 144 papers, consisting of all 4-score papers based on “agreement” scores (at least three markers agreed) in the sample (36 papers), and a corresponding 36 papers from each of the other three scores were analyzed to provide a count of all revisions between rough and final drafts in the six revision categories for the six topics.

The number of words in each rough draft was recorded, and the total number of words for the rough drafts in each score was calculated. For purposes of comparison between revision categories for each topic, score and between scores, the total number of revisions in each category for each score and topic was converted to revisions per 1,000 words of rough draft.

Of course, the number of words in the few papers in the subsample without rough drafts was not recorded as these papers were considered to be final drafts, but neither do these papers provide any revisions to the total.

An independent coder analyzed 12 papers, three from each score, to determine the replicability of revision coding. Product-moment correlation coefficients were calculated for each category to determine the degree of intercoder reliability, with .05 level of confidence considered acceptable. Agreement of 93.3% was achieved overall. Product-moment correlation coefficients calculated for each revision category averaged 0.75, significant at $p < .01$ level of confidence.

Findings

The analysis gave rise to the following findings.

Relationship of Topic to Score

Table 3 presents the data relevant to Hypothesis 1: *Where a choice of topics is offered, the topic selected for an essay does not bear a significant relationship to the score obtained.* Over a third of all students in the sample opted for topic number three. However, the greatest percentage of 4-score papers (11.9%) was written on topic number six, with topics number two (9.4%), number five (8.9%), and number one (7.6%), all producing a greater percentage of 4-scores than the most popular topic, number three. Topic number six also produced the greatest percentage (35.6%) of 3-score papers.

Chi-square analysis of the relationship of topic to score indicated a significant ($p < .001$) overall correlation between topic and score. Hence, the null hypothesis was rejected and the choice of topic was deemed to relate to the score obtained. Further examination of the contribution of cells to the overall chi-square revealed that topic number four, as well as topic number six, appeared to be related positively to score ($p < .05$).

During the holistic scoring of these essays, teacher-markers were heard to make such comments as, “If I have to read another ‘beautiful Alberta’ paper, I’ll scream!” What effect did such a remark have on the validity of the holistic scoring of other markers when they next picked up a topic number four paper to score? In fact, very few topic number four papers (2.9% as compared to 6.3% overall) received a 4-score despite the topic’s being the third most popular student choice of the six offered. Topic number three, the most popular choice, received the next least percentage

TABLE 2
Prewriting Activities Relative to Score

Prewriting Activities		Score			
		1	2	3	4
Topic Choice	Outline/Rough Draft				
Topic #1 $N_1=329$ (23.98%)	Neither outline nor rough draft.	5	12	3	3
	Outline only.	1	8	6	1
	Rough draft only.	24	152	46	14
	Both outline and rough draft.	5	20	22	7
Topic #2 $N_2=170$ (12.39%)	Neither outline nor rough draft.	3	4	1	0
	Outline only.	1	10	0	0
	Rough draft only.	15	78	21	12
	Both outline and rough draft.	1	16	4	4
Topic #3 $N_3=503$ (36.66%)	Neither outline nor rough draft.	8	12	1	0
	Outline only.	7	8	7	3
	Rough draft only.	55	241	66	12
	Both outline and rough draft.	7	45	23	8
Topic #4 $N_4=210$ (15.31%)	Neither outline nor rough draft.	2	7	1	0
	Outline only.	2	8	4	1
	Rough draft only.	31	80	24	4
	Both outline and rough draft.	8	22	15	1
Topic #5 $N_5=101$ (7.36%)	Neither outline nor rough draft.	2	0	0	0
	Outline only.	2	3	1	1
	Rough draft only.	19	32	11	6
	Both outline and rough draft.	0	14	8	2
Topic #6 $N_6=59$ (4.30%)	Neither outline nor rough draft.	0	0	1	1
	Outline only.	0	1	2	2
	Rough draft only.	4	24	13	3
	Both outline and rough draft.	1	1	5	1
Totals: $N=1372$		203 14.80%	798 58.16%	285 20.77%	86 6.27%

(4.6%) of 4-scores. Again, it would appear that frequency of choice of topic inversely affected markers' selection of the best papers. This phenomenon is observed throughout the six topics, with topic number six, the least popular topic, receiving, proportionally, the most 4-scores. The frequency polygon (Figure 1) illustrates this phenomenon further. By plotting the percentage of students who chose a particular topic against the percentage of 4-scores for each topic it is graphically shown that the percentage of 4-scores per topic is inversely proportional to the frequency of topic selection. Topic number four has not been included in the slope calculations because the teacher-marker reaction to papers on this particular topic, as discussed above, appears to have adversely influenced the number of 4-scores given, thereby contaminating the data for this topic.

Inspection of the topic statements themselves reveals a number of possible inequities among them. For instance, topic number six is the only statement given in

TABLE 3
Topic Relative to Score

Category (N=1372)	Score				x
	1	2	3	4	
Topic #1 N=329 (23.98%)	35	192	77	25	5.87 (0.15)
Topic #2 N=170 (12.39%)	20	108	26	16	7.04 (0.10)
Topic #3 N=503 (36.66%)	77	306	97	23	3.56 (0.35)
Topic #4 N=210 (15.31%)	43	117	44	6	8.70 (0.05)
Topic #5 N=101 (7.36%)	23	49	20	9	7.15 (0.10)
Topic #6 N=59 (4.30%)	5	26	21	7	12.78 (0.005)

$\chi=45.10$ with 15 df significant at $p<.001$

two sentences, the second, descriptive sentence offering some elaboration on the first declarative sentence. This statement could provide students some additional insight into the development of the essay. To a lesser extent, topic number five offers additional modification of the basic declarative statement, although the subordinate clause is not so much added description as additional declaration. The other topics offer only a simple declarative statement in each case. Moreover, topic number four, producing the least proportion of 4-scores, is the shortest statement offered of the six, appealing perhaps in its brevity and succinctness but, having caught the students' attention, offering little additional insight into the direction which the essay might take. And, finally, topic number two, the second most productive of 4-scores, suggests, in its compound form, an essay development through comparison and parallel structure. Hence it may be argued that topics number two, number five, and number six, each producing a higher than average percentage of 4-scores, offer an advantage to the students opting in their favor.

Relationship of Topic to Revision

Table 4 presents the data obtained relative to Hypothesis 2: *The type and amount of revision between rough draft and finished composition are not significantly related to the topic chosen.* Chi-square analysis of the relationship of topic selection relative to the frequency of revisions per 1,000 words in each category indicated no significant correlation between topic and revisions. Hence the null hypothesis was retained. The type and amount of revision was deemed to be unrelated to the topic selected.

Relationship of Outline and/or Rough Draft to Score

Table 5 presents the data obtained relevant to Hypothesis 3: *Students who employ an outline and/or a rough draft do not score significantly higher on their essays than those who do not use an outline and/or a rough draft.* Over 40% of the students who

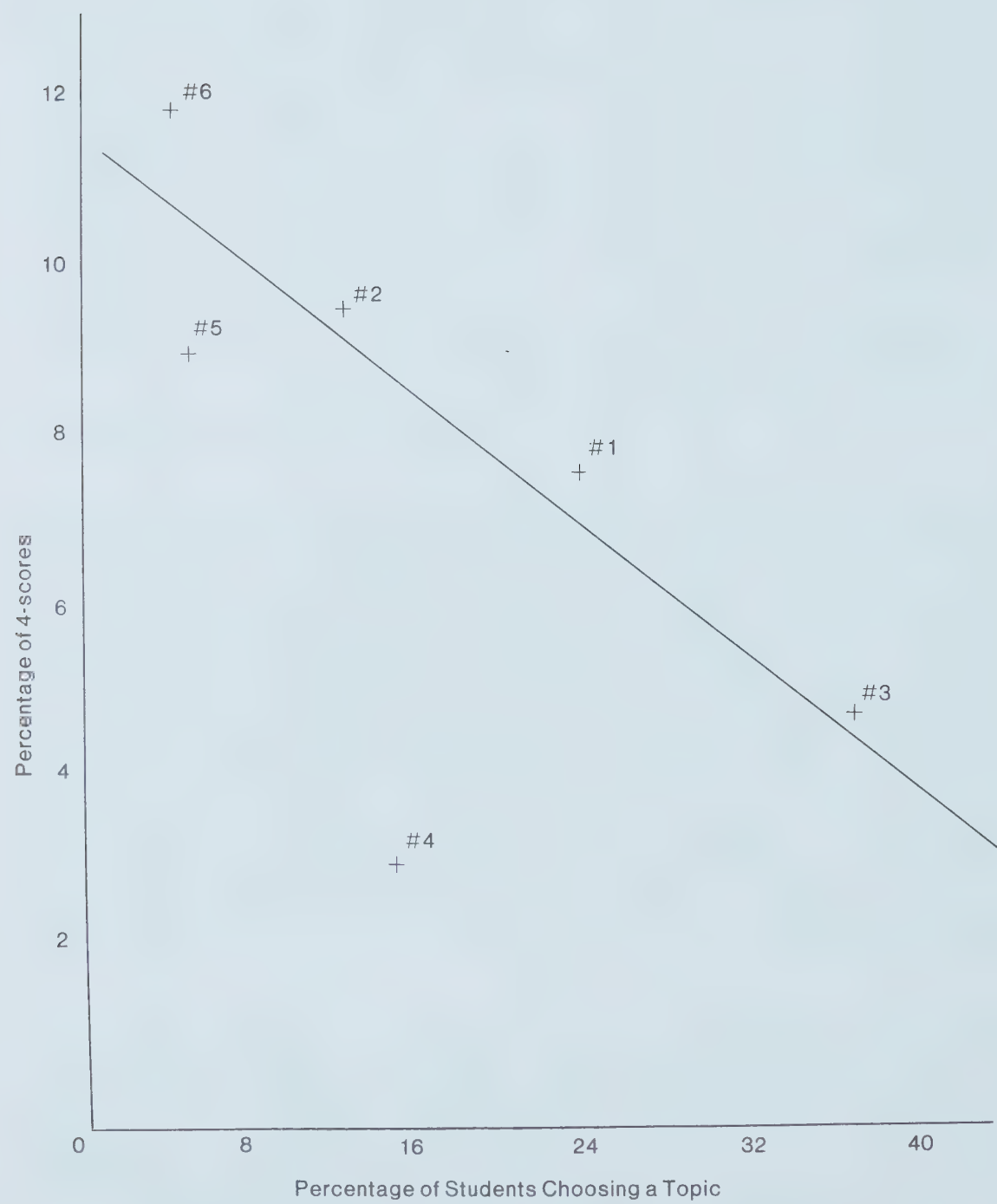


Figure 1: Topic choice relative to score

TABLE 4
Topic Relative to Revision per 1,000 Words

Category	Topic					
	1	2	3	4	5	6
Mechanical	14.13	16.19	12.9	17.4	15.02	11.4
Lexical	5.47	3.1	4.47	6.64	5.7	4.4
Syntactic	6.45	7.26	8.16	11.21	9.32	8.29
Stylistic	16.09	24.41	21.06	25.07	15.28	27.97
Figurative	10.49	14.53	14.11	23.00	12.69	14.76
Rhetorical	6.32	5.78	6.73	7.67	2.59	10.62

$\chi=12.29$ with 25 df
nonsignificant at $p<.05$

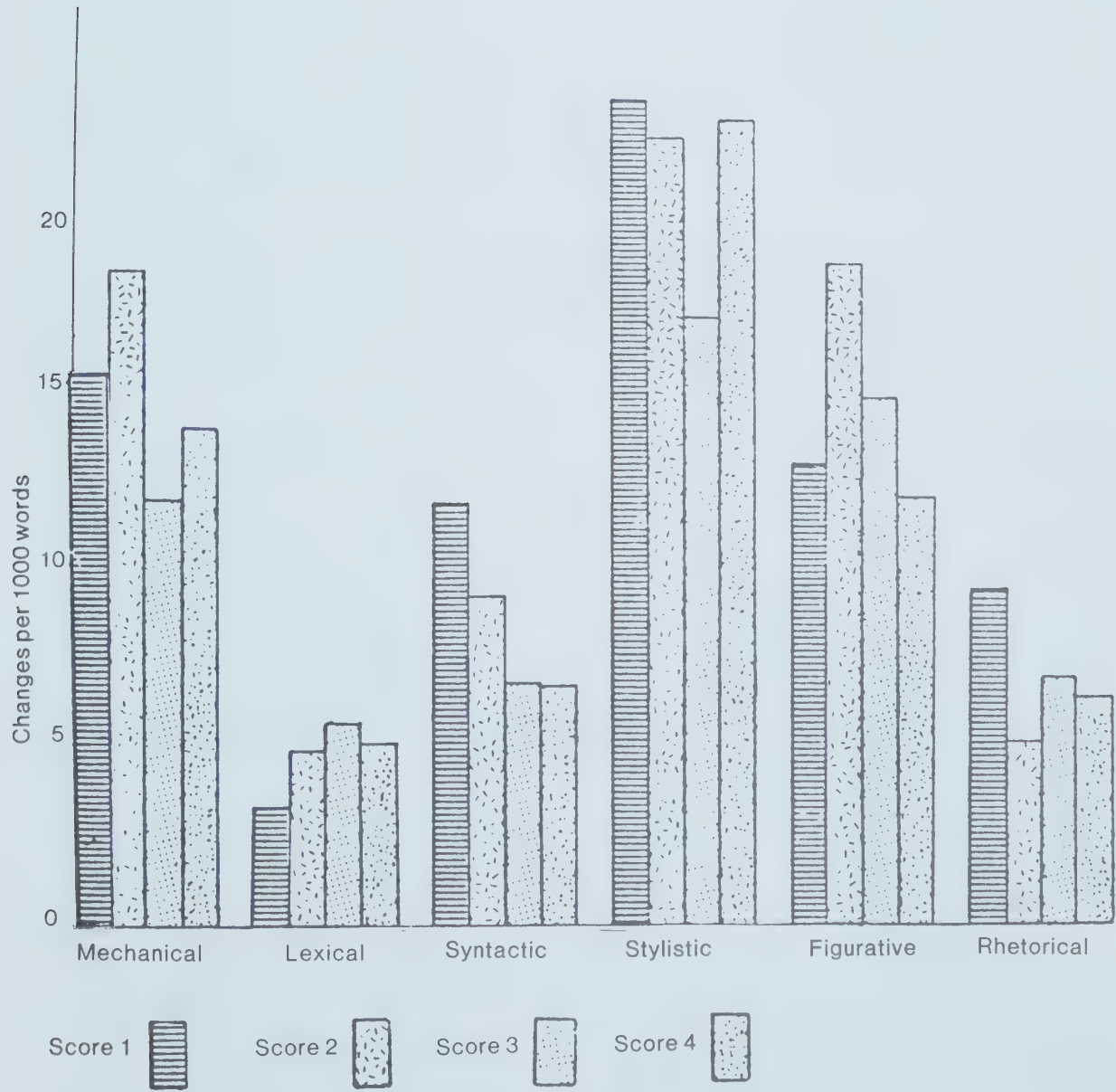


Figure 2: Revision Relative to Score

used both an outline and a rough draft scored 3 or 4 on their compositions. Conversely, over 80% of those who used neither an outline nor a rough draft scored 1 or 2 on their compositions.

Chi-square analysis of the relationship between outline and/or rough draft and score indicated a significant correlation ($p < .001$). Hence, the null hypothesis was rejected, and outlining and rough drafting used together were deemed to correlate positively with the score obtained. Further examination of the contribution of cells to the overall chi-square revealed that outlining alone does not correlate with the score obtained, thereby corroborating Emig's findings. Rough drafting alone was significant at the $p < .10$ level, and, inasmuch as this does not meet the previously set .05 level, H_0 was not rejected. However, since some relationship between rough drafting and score can be shown with 90% confidence, it would appear that more research may be warranted before any definite conclusions concerning rough drafting alone should be made, and to confirm that Type II error has not been introduced (that is, that a false hypothesis has not been retained).

Some students (4.8%) wrote neither an outline nor a rough draft and their marks reflect this—over 80% of these scored 1 or 2. Some students (5.8%) wrote an outline only and, again, the majority of these students—65% of those using an outline only—scored 1 or 2. Where outlining was combined with the writing of a rough draft, a significant correlation ($p < .001$) with the score was observed. Forty-two percent of those students who used both prewriting activities in combination scored 3 or 4 on their papers (compared to 27% who scored 3 or 4 overall—9.6% who combined both scored 4, compared to 6.3% overall).

Outlines varied in form from as few as four points jotted down in phrase—or even word (noun)—form to elaborate schemata written out in complete sentences, and sometimes involving several sentences to each point. However, where rough or final drafts developed considerably further on these schemata, despite their elaboration, the schemata were acknowledged as outlines and not as rough drafts.

Some students used numbers, some dash marks, some indentations, or spaces between points. Some students started with one method such as numbering and switched to another such as dash marks or spacing part way through. Formal outlining, such as that taught in school or displayed in some textbooks, was used in approximately 5% of the papers. Any schemata, despite its brevity or elaborateness, formal or informal, which demonstrated some thinking on the topic was counted. Of course, the amount of thinking could not be assessed, only guessed at.

One notable outlining method was used by students who began writing a rough draft and switched to point-form outlining part way through. These students sometimes switched back to complete the rough draft and sometimes the outline ended the rough draft stage. It would appear that as ideas, triggered in the composing process of the rough draft, began coming too rapidly to write down in complete sentences, the outline form offered an expedient alternative. Britton's phrase, "shaping at the point of utterance" (Cooper & Odell, 1978; p. 24), appears especially pertinent in describing these outlining practices.

Further evidence of Britton's observations was noted in outlines which were not followed slavishly—or, for that matter, at all—and which varied in length and degree of completeness. Where time is a factor, such as on a composition examination, outlining often appears to serve the purpose of starting the thinking process on the topic, and it is abandoned at some point where ideas flow freely and time is more profitably spent writing them down in complete prose form. When ideas begin to "dry up," then reversion to outline form in the middle of the rough draft may also restimulate the flow (rather than accommodate too rapid a flow).

TABLE 5
Outline/Rough Draft Relative to Score

Category (<i>N</i> = 1372)	Score				χ
	1	2	3	4	
Neither outline nor rough draft	20	35	7	4	14.30 (.005)
Outline only	13	38	20	8	4.20 (.25)
Rough draft only	148	607	181	51	6.65 (.10)
Both outline and rough draft	22	118	77	23	27.48 (.001)
$\chi = 52.63$ with 9 df significant at $p < .001$					

A few students began with outlines which became more and more elaborate as they progressed until finally they became a rough draft. Others outlined their essays completely, but developed their rough drafts only partially before beginning the final draft. Very occasionally, an outline, although on topic, was not followed sequentially at all when the rough or final draft was written. This practice suggests, in these few instances, a thinking process which is on the topic but which is not using the outline as an organizational process for the essay.

Most students (89.4%) in the sample wrote rough drafts of their essays. Seventy-two percent of the students wrote only a rough draft (no outline) prior to their final draft. Of these, 76.5% scored 1 or 2 on their papers (compared to 73% who scored 1 or 2 overall—5.2% scored 4 compared to 6.3% overall). As with the use of an outline alone, it appears that the writing of a rough draft alone is unrelated to the score obtained. An unimpressive chi-square of 6.65 with 3 df (at a level of significance of only .10) would suggest as much. However, further research into the relationship between score and rough draft may be warranted.

Rough drafting practices, like outlining practices, varied among papers. Frequently, students did not finish the rough draft prior to completing their final draft. Sometimes the rough draft was developed half or two-thirds of the way to completion and left at that point. Most frequently, a final paragraph which did not appear in the rough draft was added to the final draft. On a timed (two-hour) composition examination, this practice may be explained in part by the pressure to move on quickly to the final draft. (One hundred forty-five students, of the 1,372 in the sample, wrote only one draft which, for marking purposes, was considered to be the final draft.) However, as with outlining, rough drafting appeared to be carried out to a point where writers discovered the total content and organization of their essays, and beyond which there was no need to continue. At this point, the need to complete the rough drafts was obviated, particularly in light of time constraints, and the writers moved on to the final draft stage.

On a very few papers, the rough draft was not adhered to organizationally; that is, although the final draft dealt with the same topic generally, the sequence of ideas and, to some extent, the treatment were very different from that of the rough draft. As with the outline, this anomaly suggests that a very few students used the rough draft stage to think about the topic but not to organize or structure it in a form they would ultimately use in their final draft. For them, the organizational stage was reserved until the final draft was being written. Conversely, a very few papers were virtually

nent of the writing process, either had not been learned, or was not evident due to revision changes being made on the rough draft prior to transcription. The latter, however, did not appear to be the case from an inspection of their rough drafts.

Relationship of Revision to Score

Table 6 presents the data obtained relevant to Hypothesis 4: *The amount of revision from rough draft to finished product in each revision category is not significantly related to the quality of the finished composition.* A histogram (Figure 2) and a frequency polygon (Figure 3) provide pictorial representations of these data. The graphs show that the frequency of stylistic revision per 1,000 words of rough draft is greatest for all scores. The frequency of figurative revisions on 2- and 3-score papers ranks second along with the frequency of mechanical revisions on 1- and 4-score papers. Syntactic, rhetorical, and lexical revisions are made with decreasing frequency at all score levels.

Chi-square analysis of revision categories relative to score indicated no significant correlation between the frequency of revisions per 1,000 words in each category and the score obtained. Hence the null hypothesis was retained.

The amount and type of revision carried out by students while composing on an essay examination are unrelated to the quality of the final essay; that is, the revision changes made between rough and final drafts on 4-score papers did not differ significantly in number from those on 1-score papers. Despite this, the actual amount and type of revising that students undertake are notable. For every 1,000 words of writing, approximately 70 changes are made between rough and final drafts. These changes may be coded into six quite different categories which are used by students irrespective of the quality of the paper produced: mechanical, lexical, syntactic, stylistic, figurative, and rhetorical. For every 1,000 words of written first or rough draft, students make approximately 15 mechanical revisions, 5 lexical revision, 8 or 9 syntactic revisions, 21 stylistic revisions, 14 figurative revisions, and 7 rhetorical revision. Twenty-seven pages of revision examples and detailed discussion, somewhat after the fashion of Richards in *Practical Criticism* (1929), are reproduced in the complete research report, but are omitted here in the interest of space.

One-score papers exhibit, to a more noticeable extent than those at other score levels, revisions that involve complete changes, or apparent changes, of meaning, that is, rewriting of concepts from rough to final draft into longer often more convoluted phraseology involving confusing mental leaps, which are usually coded as figurative or rhetorical. Also, these students frequently have very little to say on the topic, and tend to say it in as many ways as possible, making revisions of repetition (rhetorical and stylistic) to fill out their text; they hope, no doubt, to impress by quantity as opposed to quality of text.

Two-score papers exhibited one revision characteristic seldom found in 1-score papers, that of a changed or sometimes alternating point of view. Rough drafts written in the first person were revised in the final draft to second or third person point of view. Those in the third person initially might change to first or second in the final draft. Usually this revision was not consistently maintained throughout the essay. These revisions, unless contaminated by associated figurative or rhetorical revisions, were coded as stylistic. Also evident at this score level was a continuing tendency to change meaning, or appear to change meaning, between rough and final drafts, coded figurative.

TABLE 6
Revision Changes per 1,000 Words Relative to Score

Category	Score				Total
	1	2	3	4	
Mechanical	15.15	18.04	11.7	13.65	58.54
Lexical	3.26	4.79	5.56	5.08	18.69
Syntactic	11.65	9.13	6.67	6.6	34.05
Stylistic	22.79	21.79	16.79	22.44	83.81
Figurative	12.77	18.4	14.16	11.79	57.12
Rhetorical	9.27	5.08	6.79	6.32	27.46
Total	74.89	77.23	61.67	65.88	279.67

$\chi=5.94$ with 15 df
nonsignificant at $p<.05$

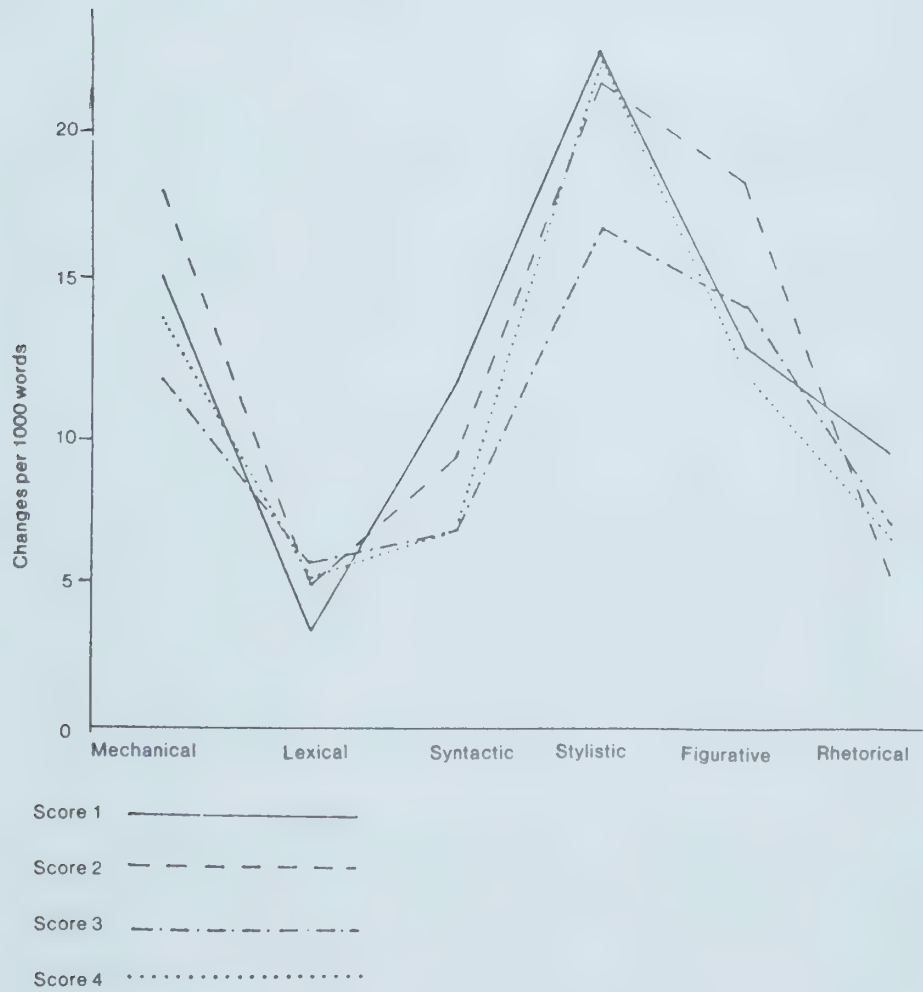


Figure 3: Revision Relative to Score

Although there is a similar frequency of revision in each category for each score, the nature of these revisions appears to be changing at the 3-score level. Complete changes or apparent changes of meaning between rough and final draft, although still found, are not quite so prevalent. Better students have more to say on a topic—average word counts in the subsample increase with score: 258, 400, 488, and 554 words, respectively—and, consequently, students seem to grope less for *what* to say and, perhaps, more for *how* to say it at this level. Fewer 3-score revisions actually weaken the final product. And point-of-view shifts occur less often as students at this level tend to favor the third person. Associated with these characteristics is an increase in the amount of revision to which a single component of text might be subjected.

Papers at the 4-score level demonstrate further the tendency of abler students to be concerned with *how* to express a concept as opposed to *what* concept to express. Again, better students have more to say, 4-score papers averaging more than twice the number of words of 1-score papers, and they demonstrate an increased interest in how to say it appropriately. Lexical revision is noticeable in these papers, as is stylistic revision. Several changes, as opposed to only one or two at lower scores, may occur in a single component of text, and these may be more difficult to categorize. The quality of revision, consistent with the intellectual abilities of 4-score students, is also noticeably superior to that found in papers of lower scores. It should be recalled that only 86 papers, 6.27% of the sample, received a 4-score grading in a total of 1372 papers in the sample.

Lexical revision in 4-score papers frequently incorporates other categories of revision as well in the same component of text. If the revisions are inextricably bound, they are coded as one change, the “highest.” If the revisions are identifiably separate, they are coded separately. Very rarely, a revision will not be coded in the “highest” category present because of some strong argument otherwise. This decision is usually based on what the writer appeared to be attempting to accomplish rather than on what was in fact achieved. The sample revisions and discussions in the complete report (Gee, 1984) exemplify these observations extensively.

Conclusions

It would appear that topics cannot be selected, despite the care and rigor exercised in their selection, so that they are of equal difficulty or quality. The structuring of the topic statements themselves, and the differences in that structuring, appear to influence the development of an essay. It also appears that, where several topics are made available on an essay examination, the students who opt for the least popular topics tend to make the highest grades or scores. Markers may be biased against a topic, get bored when marking the same topic over and over again, or more capable students may opt for one to two particular topics. Even the order of topics may influence their equality.

Students outline essays and write rough drafts in many ways. A definite correlation exists between essay quality and the use of an outline and rough draft together. Few students outline as formally as is taught in school. Some mix outlining and rough drafting. A common practice in both outlining and rough drafting is to discontinue the prewriting activity as soon as ideas and structure become obvious and time is better spent on the final draft. As well, outline form may be used to cope with ideas which are coming too fast in the midst of the development of a rough draft. Conversely, outlining, or point form listing, may restimulate the flow of ideas if they cease or slow during rough drafting. Finally, a few students appear to think about the essay topic by

using an outline or rough draft, but not to structure their final essay based on these devices. Essay organization for these students appears to be separate from conceptualization of the topic and reserved for writing of the final draft.

Although the amount of revision carried out by students on their rough drafts is similar despite the quality of the final essay produced (or the ability of the students), the quality of revision does appear to vary with student ability. Students undertake a surprising amount of revision on essay examinations. Moreover, all students use all six types of revision. Weaker students, apparently having much less to say on a chosen topic, tend to revise so as to expand their text by repetition. Consequently, they tend to produce more rhetorical and stylistic revisions of this nature than do students of greater ability. Also, weaker students tend to have more problems with *what* to say as opposed to *how* to say it, and, as a result, their revisions frequently alter meaning completely. These revisions are characterized by confusing structural changes.

Abler students tend to have more to say about a topic and appear to concern themselves more with how to say it. Revisions which result in meaning change are less apparent. Concern for the right word becomes noticeable, resulting in an increasing number of lexical revisions. More revision of a single component of text is also apparent at the 3- and 4-score levels. This concern for how a concept might appear in print results in many stylistic revisions. However, these stylistic revisions fulfill a different purpose than those used by weaker students who revise for mere repetition to add quantity of text.

Some students revise to change the point of view. Concern for this kind of revision is not overly apparent in 1-score papers. But at the 2-score level, an increasing awareness of this stylistic consideration appears to be occurring. Control of person appears to offer difficulty for these students. By the 3-score level, students tend to use third person at the outset in their rough drafts, resulting in fewer revisions of this nature in the final draft. Finally, as would be expected, revisions which tend to weaken rather than improve a passage appear to taper off as the quality of papers increases.

In summary, more questions are generated than are answered in a study such as this. Research into the composing process is still in its infancy. However, research into the writing product, as well as study of the writing process, can reveal much about the process and will do so in a fashion which may be controlled to the extent necessary for valid, reliable research. Much remains to be investigated: Should a choice of topics be given on composition examinations? Will the same level of syntax among topics result in the same level of difficulty? Should one topic only be given, or should a scenario, a picture, or music be the stimulus for tests of writing ability? Should the audience be identified? The purpose? The form? Can an effective outlining and rough drafting process be taught? Can the qualitative differences between revisions of weaker and more able students be identified? Can the revision process be taught more effectively than it now is? This much is known:

1. Where a number of topics is offered for examining writing ability, the topic selected bears a significant relationship to the score obtained.
2. The type and amount of revision carried out on an essay is not related to the topic chosen.
3. Students who employ an outline and a rough draft together score significantly higher on their essays than those who do not.
4. The amount of revision which occurs between the rough and final draft of an essay in an examination setting is not related to the quality of the essay obtained, although the quality of the revision may be.

The fact that all students do much more revision of their writing in an examination setting than was initially suspected is surprising in itself. That they revise for six distinct purposes, despite their abilities, is remarkable. The need now is to determine how that revision might be directed toward the production of higher quality writing from all students.

Note

1. Appendices containing a sample booklet, a coding card, and raw data for each score are available on request from the author.

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As Some Children Write More Than Others: The Impact of Learning to Write

This study compares the impact of two pervasive instructional approaches on the attitude toward and understanding of writing among grade 1 students. One approach is based on an introduction to the skills of writing and the other sets out to treat the students as writers by having them write. The sample consisted of six classes (N=109) split between the two approaches. The students were interviewed on four aspects of writing—function, attitude, self-concept, and vocabulary—initially in October and then again in May of the same school year. An analysis of the change over the course of the year revealed a significant gain in the technical vocabulary of literacy for the students who learned by writing, but not in their attitude or in their self-concept as writers.

This has proved a promising decade for writing instruction. From the work of Graves (1983; Hansen & Graves, 1986) on the east coast to the Bay Area Writing Project (Myers & Gray, 1983) on the west, strong programs have emerged backed by outspoken advocates. Simply put, these programs would have students write from the very beginning as writers. Recent research into the process and acquisition of writing suggests that little else may be needed (Harste, Woodward, & Burke, 1984; Smith, 1982). Rather than waiting until the skills to write are in place, students in the first grade are encouraged to find their way into print and publishing without going through the workbook approach to prove and practice their readiness. Thus far the reports on this new method have been principally testimonial and ethnographic, with enthusiastic results in both cases. What has been repeatedly found is that the students are writing marvelous things and that they are proud of what they write (e.g., Silvers, 1986; Willinsky, 1984). The claims are supported by impressive instances of the students' work. The celebration of this work is underwritten by a sense both of the improved performance of the children and their improved attitude toward writing. The question which this study takes up on a very modest scale is whether we can ascertain more precisely the differences this writerly introduction into literacy in the

first grade might make when compared with the experience students receive in what might be contrasted as a skill-sequenced approach.

A review of the strong but often implicit claims made by those who advocated learning by writing (the expressive-writing approach) suggested that there should be a measurable improvement in three areas: (a) the students' understanding of the function of writing, (b) their attitude toward writing, and (c) their regard for themselves as writers. On the other hand, the literature also suggested that the traditional or a skill-sequenced approach to writing through preparatory steps would produce a stronger sense of what a word or a sentence are.

In order to appreciate the study which follows, it may be helpful to review the basis of those claims. The expressive-writing approach, for instance, is designed to address the limited range of functions writing serves in the schools (Rosen & Rosen, 1973). Britton's scheme of expressive, transactional, and poetic modes has been used to map out the limited nature of students' written work in school; Halliday's taxonomy of seven language functions is often cited to suggest the missing elements. Holdaway (1979), for example, cites Halliday in declaring that we should be exploiting what he terms writing's "functional richness" rather than maintaining in the classroom the more common "narrow range of purposes" (p. 14). As the call in this approach is for students to write as writers, these student-writers are to grasp the real world of writing and the full range of its usefulness (Baker, 1984). Thus we might expect that young students will learn more through this experience of (a) what a writer does, (b) who writes, and (c) what writing is good for. Accordingly, it was decided to ask the students of the grade 1 class about these three points in order to ascertain their sense of writing function.

On the second item of inquiry—importance of the students' attitude toward literacy—Johns (1974), for one, found that a key difference between good and poor readers was that good readers saw reading as a meaningful experience with a significance outside of the classroom. It seemed appropriate to borrow from Johns' work on reading attitudes to explore a comparable aspect in the student's appreciation of writing's purpose. A particularly crucial question in the attack on the skill-sequenced program led by such figures as Graves and Holdaway has been on the very shortage of meaning which occurs in its emphasis on the skills of letter identification and decoding. We might expect that, spared this process in favor of writing out their own experiences, of acquiring ownership over their own work, the expressive-writing students' attitude toward writing should appreciably improve as should their sense of its role or function outside of the school.

Self-concept was the third area of inquiry and an old strand in progressive programs. As the students realize a new written voice, they should discover a new sense of themselves as writers. Since the turn of the century, the progressive movement has advocated the psychological benefits of creative writing (Brand, 1980). Over this time writing has been viewed as a means of unfolding the child's personality, providing self-confirmation and a sense of dignity; as the child wrote in this fashion, progressives claimed, "the more a person he became" (Suffinsky, 1933). Writing was a matter of "the whole problem of individual identity and how it develops" (Holbrook, 1968, p. 1). We were "writing to create ourselves," as one recent writing text claims on behalf of students (Allen, 1982) or, to return to Graves, "the child's marks say 'I am'" (1983, p. 3). Finally, on a less existential note and yet with more hard research to support it, a positive sense of self has proven to be related to a success in literacy which extends to academic performance in general (Brookover, Thomas, & Patterson, 1964; Campbell, 1965).

On the skill-sequenced side, a sensitivity to the units of written language in developing literacy has long been an important part of the study of reading readiness (Evancheko, Ollila, Downing, & Braun, 1973). A writing vocabulary, from having a sense of sound-letter correspondence to acquiring the elements of a technical vocabulary of literacy, would seem to be crucial in the decoding process as it concentrates on taking meaning from the nature of individual elements and not from contexts; this isolation of elements receives a corresponding emphasis in the students' work in the skill-sequenced classrooms through worksheets: "copy these words over"; "what letter does this word start with"; "complete this sentence." With this focus, these students were expected to achieve more in the skills of word and sentence identification. In the expressive-writing classroom, this technical vocabulary of literacy arises, if at all, in an incidental manner, through the actual use of such elements as words and sentences (Graves, 1983).

Method

This study used a pretest posttest design to ascertain changes in the student's regard for writing in a manner which could be measured and compared under two different programs of instruction. The test instrument consisted of 22 questions which were individually administered to the grade 1 students in a 10-minute interview which was conducted in October and then again in May of the same school year (Table 3). The questions covered the four areas described above: writing function, writing attitude, self-concept, and technical vocabulary. The test instrument used with the students contains a number of items borrowed and new. In the areas of vocabulary and writing function, the items came from the methods of Downing and Oliver (1973-1974) for testing the identification of "words"; Calkins (1980) for punctuation; and Mayfield (1983) for writing function. The groundwork in assessing writing attitudes and self-concept as a writer had not been so thoroughly laid. To measure the changes in the students' regard for themselves over the course of grade 1 both direct questions—"Are you a writer?"—and more subtle means were employed. After examining the meager resources for assessing self-concept in young schoolchildren, it was decided to use a variation on the picture self-identification technique. Seven cartoons were developed in male and female versions which showed a fairly uniform set of characters in a number of activities and situations from the classroom to the doctor's office. The students were asked to select one figure in each picture who they would be "if they had to be one of the people in the picture." The characters had been designed to represent either an active or passive pose, with the student's selection addressing the question of whether an active, developed sense of self was encouraged by fostering the student's personal voice on the page.

The pictures were initially tested with a class of students and the reasons for their choices were used to modify the cartoons, removing what appeared to be extraneous and distracting elements. With the pictures adjusted, the entire instrument was piloted with a class of 20 students after which further refinements were made to the ordering and wording of the questions. The interviews with the students were held in the school library and began with the cartoons as these were found in the pilot to put the children at their ease.

In terms of scoring the results of the individual interviews, the questions were designed to produce four simple measures: for Writing Function, the students were credited with the number of instances given to such inquiries as "what can be done with writing?" Writing Attitude was scored by the number of items given to such questions as "what are all the good/bad things about writing?" arriving at a positive/

negative score for the student's attitude; Self-Concept was also a measure of positive responses to the inquiries or "active" choices with the pictures; and Technical Vocabulary was a matter of adding up the correct responses. To analyze the impact of the two programs, *t*-tests were run on the differences in raw scores between the October and May interviews to establish the significance of the change over the year in their understanding and regard for these different aspects of literacy.

The sample for this study consisted of six grade 1 classrooms ($N=109$). The classrooms were picked on the advice of the language arts coordinator for the district who was asked to recommend three teachers clearly using an expressive-writing approach and three clearly using a skill-sequence approach; this selection process was further refined by ensuring that the teachers were in schools which were roughly equivalent in the socioeconomic level of the neighborhoods. The actual writing programs used in the classrooms were monitored by collecting daily samples of the work of six randomly chosen students from each of the six classes over the course of eight two-week periods during the same year. These writing samples demonstrated that though there was a clear distinction in writing instruction between the two programs, the classrooms proved to be other than either ideal or pure instances of either approach.

As can be noted in Table 1, a few workbook pages did turn up in the samples collected from the expressive-writing classrooms and the odd narrative was written in the skill-sequenced classroom, which is to say that the study was conducted in typical classrooms in the hands of typical teachers. The degree of implementation is representative of what we might expect in the filtration and adaptation of ideas throughout the school system. The actual measure of the differences in the nature of the writing of the students in two programs suggests that in a typical week in the skill-sequence classrooms the students did about three skill sheets, compared to less than one on average for the expressive-writing classrooms; in the amount of sustained writing, the expressive-writing students wrote two and one-half pages compared to little over half a page for the skill-sequenced students. Judging by what the students actually produced, it seems clear that the language arts consultant provided a relatively accurate reading of the differences in program.

Results

Of the four composite measures in which we might have expected a sizable improvement of one program over another, only in the technical vocabulary of literacy did the expressive-writing classes make significantly greater gains than the skill-sequenced classrooms (Table 2). To check the relationship among the four composite measures a Pearson product moment correlation coefficients matrix between all of the pairs was calculated. The highest correlation was .26 between writing function and self-concept. Because gender has proven to be an important influence in children's response to schooling, the results were also run for significant differences in the gains made by gender and none found were in the four composites. Finally, an analysis of variance was used to determine the interaction effect between program and gender; there was no significant interaction on the composite measures.

The students' grasp of the function of writing (of who writes, what an author does, what can be done with writing, and what do you make stories about) showed a gain in both programs which did not differ significantly in the composite scores. But on one of the individual items—"what can be done with writing?"—the expressive-writing class was able to name a significantly larger number of functions for writing over the course of the year ($p < .05$), with the skill-sequenced class coming up with fewer functions in the final interview than they had offered eight months earlier.

TABLE 1
Average Number of Pages per Student in a Week by Type of Writing

Group	N	Type of Writing (in pages)	
		Skill ^a	Expressive ^b
Skill-Sequenced Students	57	3.18	.59
Expressive-Writing Students	52	.73	2.69

^aSkill-based writing included work on phonetics, letter formation, and sentence completion.

^bExpressive writing demonstrated student control of units of at least a sentence in length.

TABLE 2
t-Tests of Pretest to Posttest Gains on Four Composite Measures

(N=109) Item	Skill-Sequence		Expressive Writing		(df=107)	
	Means	SD	Means	SD	<i>t</i>	<i>p</i>
Writing Function	.1105	5.771	1.2885	5.374	−1.10	.272
Writing Attitude	.1075	2.232	−.5962	2.107	1.47	.144
Self-Concept	10.5789	3.775	9.8269	2.988	1.15	.254
Writing Vocabulary	2.3508	4.042	5.0557	3.528	−3.71	.001

In the attitude measures, the expressive-writing class’s positive responses to the activity of writing declined over the course of the year while the skill-sequenced class did not grow appreciably more positive toward writing. This decline in the regard for writing among the students working in the expressive-writing program raises the most interesting challenge. The measure is admittedly crude; attitude measures are always a source of caution and qualification. But in examining the different aspects on which the students were queried, it does seem that a teacher who does more personal and extended writing with the students will not ensure a growth of a higher regard for the virtues of writing. Students working with skill sheets were no less positive about writing. It would seem that as the students in the expressive-writing classes did more writing and had more demanded of them in writing, they knew enough of its intricacies to name what was termed in the interview question “the bad things about writing.” The bad things ranged, in the students’ words, from the problem of “messy writing” and “scribbling” to “if you don’t know what you are supposed to do.” The good things about writing, on the other hand, included the fact that you “make pictures and write stories,” “learn about stuff,” and “exercise arms.” That these writers who wrote four times as much as the other students could also suffer a decline in their opinion about whether writing is a good way to say something would also seem to indicate a certain level of frustration with the act. Perhaps some of this frustration is avoided in the lockstep, programmed skills approach to writing readiness.

In the assessment of self-concept, both groups made similar gains in their declarations of themselves as writers and as readers. This was equally so with the set of cartoons for self-identification, as both groups made a similar move to more active

figures. However, the clearest gains in one program over another was in the technical vocabulary of writing rather than in the students' expression of their affective or functional regard for writing. With the elements of a writing vocabulary measured, from the identification of words and sentences to naming the components of a story, the expressive-writing class achieved a significantly better gain. Still, this was somewhat other than what might have been expected. In the skill-sequenced classes, the students' work showed a focus on the word, for instance, as they copied the words from the board or the top of their sheet, as well as on the word's parts as they identified the initial sounds through picture-letter matchups. Yet the expressive-writing students achieved a greater gain in their oral identification of a word as a unit, with only a slightly weaker show in identifying words in the written format. Understandably, with the opportunity to write narratives, this group also showed a significantly greater gain in their ability to identify the major punctuation marks.

Discussion

This initial study suggests that having students do more extensive and "meaningful" writing will not ensure a notably greater expression of a confidence in themselves as writers nor a greater enthusiasm about the possibilities of writing, though they may show signs of a greater sense of its usefulness in the world at large. The students in both classes were not in a position to evaluate their instruction in comparison to how adults write, as we would, especially in relation to how the professional author writes. If the skill-sequenced students did not find their introduction to writing as stifling as Smith (1982) predicts, it may be because they have no romantic notions of writers working away in New York studio-lofts or Rocky Mountain cabins with which to contrast to their own sorry assignments. The skill sheet provides an immediate sense both of writing and of a clear-cut competence marked with a sticker, however distant it is from having a story accepted by *The New Yorker*.

On the other hand, the students who had the opportunity and responsibility to sustain their work for a page or more could be expected to know in more detail the difficulties or "bad things about writing." Professional writers, after all, are quick enough to tell you about the terror of the blank page which they face time and again: Graves (1984), for example, confesses that "all of the writing in these years (1978-1982) was very painful to me" (p. 5). Yet he and other expressive-writing advocates are the ones who wax enthusiastic about the creative pleasures of these child-writers, and though they might expect the children to catch a good part of their enthusiasm for writerly writing, the students seem to catch no more of it than is provided in classes where they are child-students carefully mastering and climbing the steps to literacy.

These findings also suggest, again in a qualified manner, that students who write more independently at least seem to learn more about the units of writing—the word and sentence—which they have worked on so diligently; they seem to know more, too, about the function of writing, as they have done more with it. In comparison with such gains, the larger questions which expressive writing begs—are the students changed by writing? are they creating or finding themselves on the page?—must continue to be guided by acts of faith. The exploratory effort to tap changes in self-concept through the use of the cartoons suggested that both grade 1 groups had made a slight shift in their identifications to more assertive characters, as if getting out into the public forum of the school full time might in itself be an uplifting experience. Yet whether writing out of oneself is a means of creating a self-concept of greater agency remains to be established.

It will take a number of different designs and repeated measures to ascertain with any degree of certainty the impact on students of these different introductions into literacy. The question is not simply academic. Teachers are currently confronted by advocates of the two contesting paradigms for introducing children into literacy, and they deserve to see the respective claims of the two approaches tested and compared. Research must continue to be done on the role of self-expression in the development of the child, as well as into the question of whether broadening the function of writing can have lasting effects on participation in the literacy of the community. Finally, there remains the extent to which a skills approach can still lay a foundation of self-confidence and competence in literacy, which is to say that both approaches, the skill-sequenced and the expressive-writing, continue to deserve careful scrutiny and more sophisticated techniques in assessing what students are learning about writing and about themselves as they are taken down these different roads to literacy.

TABLE 3
Interview Schedule

Writing Function	
1.	What are all the things you like to make stories about?
2.	What can be done with writing?
3.	Who do you know who writes?
4.	Who do you write for (make stories for)?
5.	What does an author or writer do?
Writing Attitude	
6.	What are all the good things about writing?
7.	What are all the bad things about writing?
8.	Is writing fun?
9.	Do you make something with writing?
10.	Is writing things down hard work?
11.	Is writing a good way to say something?
Self-Concept	
12.	Who would you like to be in this picture? [seven pictures]
13.	Are you a writer or a printer?
14.	Are you a reader?
15.	Who is interested in what you write (in your stories)?
16.	Would you like to make books for others to read?
Technical Vocabulary	
17.	Is this a word? [say bicycle, er, friend, b]
18.	How many words is this _____, one or two? [yellow; kangaroo; my friend; went swimming]
19.	Does this card have one word on it, or more than one?
20.	Can you find three sentences in this story?
21.	Can you show me a period, a question mark, an exclamation mark, and quotation marks?
22.	What things make up a story?

Note

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A Comparison of the Reading Processes of Adult Illiterates and Four Groups of School Age Readers

The purpose of this study was to describe and compare the reading processing behavior of adult illiterates and low and regular readers in grades 2 and 4 when reading narrative and expository text at their instructional level. The observed data were categorized according to different cognitive processes and grouped into three clusters: code dominant, meaning dominant, and control dominant. Indicators of reading effectiveness were also determined and were designated as Cluster 4.

The results of MANOVAs indicated that while adult illiterates were most like the grade 2 readers in terms of their processing behavior, they were more effective than these readers in their reading, which may be due to the adults being able to use more elaborate prior knowledge schemas in relation to their processing. The results also point to the complexity of the cognitive aspects of reading and the inappropriateness of focusing on single processing variables.

Illiteracy is a serious problem among adults in the United States and elsewhere (Nickerson, 1985). Efforts to ameliorate this problem are not always successful, particularly in light of a drop-out rate of more than 50% and even higher for low achieving adult illiterates. One reason for this high rate of attrition is that literacy programs are not always meaningful to adult illiterates (Harman, 1984).

While programs for adult illiterates are frequently based on programs for young children, models for describing literacy for children may not be easily transferred to adults (Lytle, Marmor, & Penner, 1986). While some aspects of a model describing adults and children are likely to be different (especially the uses and effects of literacy) it is possible that cognitive processing demands may be similar. While much is known about the cognitive processing of children, little is known about how adult illiterates process print (Arnove & Arboleda, 1977; Kavale & Lindsey, 1977; Lindsey & Jarman, 1984). It was the purpose of this study to describe and compare the cognitive processing of a group of adult illiterates and four groups of school age children when reading narrative and expository text at their instructional level.

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Reading is commonly described as an interactive or transactive processing activity in which readers interrelate information from the text (visual information) and information from past knowledge (nonvisual information) in order to construct meaning for the text (Goodman, 1970; Rosenblatt, 1978; Rumelhart, 1977; Smith, 1982; Stanovich, 1980). The nature of this interaction is rather complex (Rigg & Kazemek, 1983) since cognitive processes do not operate independently (Cronin, 1982), but occur "sometimes in parallel, sometimes sequentially" (Kintsch & van Dijk, 1978, p. 363). Stanovich (1980) maintains that readers process texts not only in an interactive manner but also in a compensatory manner, that is, the reader operates through a series of checks and balances in allocating cognitive capacity according to the various demands in making sense out of text.

The nature and degree of a reader's cognitive processing may be influenced by a number of factors such as the reader's affective state, the amount and nature of prior knowledge and language competence, and the difficulty and nature or structure of the text. The two latter factors were investigated in relation to the cognitive processing of the subjects, while an attempt was made to control the others through the selection of subjects and materials.

Research by Reiser and Black (1982) showed that the nature of the text structure influenced the manner in which it was processed for meaning. They stated that whereas in reading expository text a reader is concerned mainly with building or expanding knowledge structures in narrative text the reader's main task is to access an *appropriate* schema within which various knowledge statements may be incorporated and tied together in a causal manner. Although researchers such as Mandler and Johnson (1977), Meyer (1981), and Rumelhart (1977) have delineated the nature of various text structures and have studied the implications of such structures for reading comprehension, they have not compared readers across narrative and expository text.

Method

The means employed to achieve the purpose of the study are described below.

Sample

A sample of 20 adults was obtained through the assistance of the coordinator of a literacy project using volunteer tutors for adults whose reading levels ranged between 0 and grade 9. Adults whose reading levels were about grade 4 level or below were requested, since it is this group which is largely ignored (Lytle, Marmor, & Penner, 1986). All adults had been interviewed by the literacy project personnel and assessed by the Standard Reading Inventory (McCracken, 1966) with respect to reading achievement level. The reading achievement levels of the 20 adults chosen for the study ranged from primer to grade 3.5, with a mean of 2.4. There were no IQ scores available for the adults, but none were considered mentally handicapped according to project personnel. All except three of the adults were being tutored through the project. These three, although interested in receiving help, were not able to do so at that time because of personal reasons. The adults represented both lower and middle socioeconomic levels and ranged in ages from 21 to 60 years. Approximately one-half of the group were unemployed at the time. Two were homemakers and one was a retiree. While some saw literacy as a step toward employment, others saw it as a means of personal development.

Twenty low and 20 regular achieving grade 2 students were drawn randomly from populations of 32 and 43, respectively, in schools assigned for the study by a large urban school system. All 21 low and 22 regular achieving grade 4 students available were included in the sample. Low and regular achieving readers were so designated by

the school principals and teachers and reading achievement scores of the Gates-MacGinitie Reading Test (1980) were then obtained from the school records. The mean reading achievement scores of the low and regular achieving grade 2 readers were 1.5 and 2.7 respectively, which were significantly different, $T(38)=12.84$, $p<.001$. The mean reading scores for the low and regular grade 4 students were 2.8 and 5.7, also significantly different, $T(41)=12.01$, $p<.001$. All readers were within the average IQ range as assessed by the Primary Mental Abilities Test (1965) for the grade 2 readers and the Canadian Cognitive Abilities Test (1980) for the grade 4 students.

The four schools from which the sample was drawn were located in middle and lower socioeconomic areas of the city. Like the adult sample, all were native speakers of English. More specific information on the sample is given in Table 1.

Narrative and Expository Texts

The narrative passages were written by Cronin (1982) using criteria developed from the literature on story grammar, lexical difficulty, and sentence complexity. The specific criteria ensured that the passages were similar in nature to the passages of reading instructional materials and that there was a progression of difficulty over grade levels. The passages may be considered to possess ecological and construct validity. Passages were written at six levels (grades 1 to 6) and each passage involved a story dealing with a particular animal. In a pilot study with five adults (not part of the sample) passage 1 was found to be too difficult for some and the experimenter wrote two simpler passages at a primer and preprimer level based on the criteria outlined by Cronin.

The expository passages were taken from the science section of Form B of the Individual Evaluation Procedures for Reading (Rakes, Choate, & Waller, 1983). Both Forms A and B consist of three sections or sets of passages (literature, science, and history) and within each set there are 11 passages ranging from primer level to grade 10. Vocabulary and sentences in the passages were patterned on high frequency counts from commonly used basal reader series. Field tryouts of all passages were conducted on 1,171 children. The science passages in Form B were chosen since the topic was animals, thus corresponding to the topic of the narrative passages. In order to parallel the narrative passages at the low levels, a passage at the preprimer level was written by the experimenter.

Instructional Level

Passages were designated as instructional level if the reader made 10% or fewer uncorrected miscues and of these miscues at least 75% resulted in no or minor meaning change (see Table 10 for definition). Passages that were more difficult according to these criteria were designated frustration level, which Silvaroli (1982) describes as the level where comprehension is poor and where there is tension and slow, halting reading. Since regular achieving readers in grades 2 and 4 would not likely engage in reading materials at frustration level, materials at this level were not analyzed.

Procedure

The researcher and two trained assistants administered the passages which the subjects read orally in a one-to-one situation and immediately afterward gave a free recall of what they had read. The subjects were told that the passages would become increasingly difficult but that it would be appreciated if they would try as much as

TABLE 1
Information on the Sample

	Low 2	Reg. 2	Low 4	Reg. 4	Adult
Reading achievement range	1.3-1.7	2.3-3.9	1.9-3.5	4.2-7.2	P-3.5
Reading achievement mean	1.5	2.7	2.8	5.7	2.4
IQ range	96-112	99-118	98-110	95-115	NA
IQ mean	109	112	106	110	NA
C.A. range	7.2-8.1	7.0-7.11	9.1-10.2	9.3-10.0	21-60
C.A. mean	7.3	7.4	9.5	9.3	NA
Female	6	11	4	11	9
Male	14	9	17	11	11

they could. All subjects were most cooperative. The order of administering the narrative and expository passages was varied so that if the first subject received a narrative set first, then the second subject received the expository set first. Each subject received a sample passage from each set.

Data Analysis

On the basis of the literature reviewed, a number of cognitive processes were identified. Because the intent of the study was to describe the processes of adult illiterates and compare them to the processes of children *while reading*, and because cognitive processes are not directly observable but must be inferred from ongoing behavior, each process was operationally defined in terms of data obtained while the adults read orally. Since some processes could not be operationalized on the basis of miscue data (for example, inferring), these were excluded.

The processes chosen for description were: attending, analyzing, symbol-sound associating, meaning associating, predicting, synthesizing, and monitoring. Processes are not independent of the text data being processed, nor are they independent of each other. In order to reflect those interdependencies, the processes were grouped into three clusters. Cluster 1, a *code dominant cluster*, included the processes of attending, analyzing, and symbol-sound associating, and focused on within-word structure. Cluster 2 was termed a *meaning dominant cluster* and comprised the processes of meaning associating, predicting, and synthesizing, and focused on words, phrases, and sentences. The third cluster included monitoring variables and was designated the *control cluster*. A fourth cluster was identified which included effective reading behaviors: ratio of miscues to words read, nature of meaning change, pronunciation of key words (concepts), and recall of key units.

All data were transcribed and assigned to a particular process or behavior within each of the four categories. All tabulations were summed across passages at the instructional level and converted to ratios (see Table 10 for definitions and scoring procedures). Interrater reliability by two independent raters for assigning data to categories was 93.2% agreement.

Differences across readers and text type by cluster were tested by a multivariate analysis of variance. Where differences occurred, each subvariable within the cluster was subjected to a univariate MANOVA.

TABLE 2
MANOVA Pairwise Contrasts by Group on
Cluster 1 and Subvariables

Cluster 1	<i>df1</i>	<i>df2</i>	<i>F</i>	<i>p</i> <
Adult - Low 2	10	187	4.60	.001
- Reg. 2	10	187	2.77	.01
- Low 2	10	187	2.71	.01
- Reg. 4	10	187	4.73	.001
Var. 2 (Mod attend)				
Adult - Low 2	1	196	15.01	.001
- Reg. 2	1	196	8.31	.01
- Low 4	1	196	6.49	.01
- Reg. 4	1	196	10.49	.001
Var. 3 (Low attend)				
Adult - Low 2	1	196	2.51	NS
- Reg. 2	1	196	.33	NS
- Low 4	1	196	8.21	.01
- Reg. 4	1	196	18.15	.001
Var. 8 (Final letter cues)				
Adult - Low 2	1	196	15.53	.001
- Reg. 2	1	196	.69	NS
- Low 4	1	196	2.92	NS
- Reg. 4	1	196	3.69	.05

TABLE 3
Means and Variances by Groups on Cluster 1 Variables
for Which There Were Significant Differences

	Adult	Low 2	Reg. 2	Low 4	Reg. 4
Var. 2 (Mod. attend)					
$\bar{X}$	.15	.04	.07	.08	.06
Var.	.02	.00	.01	.01	.02
Var. 3 (Low attend)					
$\bar{X}$	.18	.20	.20	.32	.38
Var.	.02	.07	.06	.04	.04
Var. 8 (Final letter)					
$\bar{X}$	.58	.79	.63	.67	.68
Var.	.04	.04	.10	.03	.04

Results

The analysis yielded the following results.

Processing Clusters

The results for Cluster 1 indicate that there were significant main effects for reader groups $F(40, 710) = 1.95, p < .001$ and text type, $F(10, 187) = 2.07, p < .05$. There were no significant interaction effects, $F(40, 710) = .91$. Only at the cluster level was the nature of the text significant in terms of the processes used. Similar findings for text occurred for Clusters 2 and 4.

In order to determine which reader group contrasts were significant, Cluster 1 and each of the subvariables for which there were significant differences across groups were subjected to post hoc MANOVAs. The results are shown in Table 2. Adult illiterates differed significantly from each of the other groups on Cluster 1 (Code Dominant Processing). The three subvariables within this cluster for which there were significant differences among groups were moderate and low attending, and analysis of words by final position. The means are given in Table 3. Adult illiterates engaged in more moderate attending than all other groups. They were also less likely to select final letter cues than were low grade 2 and regular grade 4 readers.

There were also significant main effects for group $F(24, 667) = 3.49, p < .001$, and text type $F(6, 191) = 5.19, p < .001$, with no significant interaction effects $F(24, 667) = 1.48$, for Cluster 2. Table 4 reports the post hoc MANOVA contrasts by reader groups on Cluster 2 and the four subvariables for which significant differences were indicated. Means are given in Table 5.

The adult illiterates differed from all other groups on the nature of their Meaning Dominant processing. Within this cluster, significant differences occurred for the subvariables, synthesizing (sentence and part sentence units) and predicting (from preceding phrase). Generally, the adult illiterates engaged less in synthesizing at the sentence and part sentence levels when utilizing appropriate semantic and syntactic cues; they demonstrated more instances of synthesizing when semantic though not syntactic cues were used appropriately. They also engaged in less predicting based on the meaning of the phrase prior to the miscue.

The results for Cluster 3 indicated significant main effects for reader group only, $F(12, 513) = 2.22, p < .01$. The data in Table 6 show that the adult illiterates differed significantly from all groups except the low grade 2 readers on the Control Processing Cluster.

The one subvariable for which differences across groups were significant was hesitation. As in the case of the findings for the total Cluster, the adult illiterates and low grade 2 readers did not differ on this variable. From the data in Table 7, it can be seen that hesitations were quite characteristic of the reading behavior of these two groups. A hesitation occurred for almost every miscue compared with the regular grade 4 group who hesitated only once for every 10 miscues. Thus it seems that the two groups of readers with lowest achievement scores were more unsure of themselves as they read and tended to engage in considerable overt monitoring when asked to read orally.

Reading Effectiveness Cluster

There were significant differences across reader groups, $F(24, 667) = 4.34, p < .001$ and text type, $F(6, 191) = 9.81, p < .001$ on the overall measure of reading effectiveness. There were no significant interaction effects, $F(24, 667) = 1.14$.

The data in Table 8 indicate that the adult illiterates differed significantly from all other groups on the Reading Effectiveness Cluster. The means are given in Table 9.

Significant differences occurred between adult illiterates and all other groups on the miscue ratio. However, unlike the low grade 2 readers, only very few of these

TABLE 4
MANOVA Pairwise Contrasts by Group
on Cluster 2 and Subvariables

Cluster 2	<i>df1</i>	<i>df2</i>	<i>F</i>	<i>p</i> <
Adult - Low 2	6	191	3.28	.01
- Reg. 2	6	191	6.68	.001
- Low 4	6	191	4.12	.001
- Reg. 4	6	191	4.65	.001
Var. 2 (Synthesizing—inappropriate syntactic cues)				
Adult - Low 2	1	196	1.48	NS
- Reg. 2	1	196	5.05	.05
- Low 4	1	196	5.30	.05
- Reg. 4	1	196	6.29	.01
Var. 3 (Synthesizing—sentence)				
Adult - Low 2	1	196	4.25	.05
- Reg. 2	1	196	1.67	NS
- Low 4	1	196	.98	NS
- Reg. 4	1	196	11.00	.001
Var. 4 (Synthesizing—part sentence)				
Adult - Low 2	1	196	2.19	NS
- Reg. 2	1	196	.68	NS
- Low 4	1	196	7.38	.01
- Reg. 4	1	196	4.87	.05
Var. 6 (Predicting—preceding phrase)				
Adult - Low 2	1	196	7.61	.01
- Reg. 2	1	196	1.51	NS
- Low 4	1	196	4.33	.05
- Reg. 4	1	196	1.35	NS

TABLE 5
Means and Variances by Groups on Cluster 2 Variables
for Which There Were Significant Differences

Cluster 2	Adult	Low 2	Reg. 2	Low 4	Reg. 4
Var. 2 (Synthesizing—inappropriate syntax)					
$\bar{X}$	.20	.15	.11	.11	.10
Var.	.06	.04	.02	.01	.01
Var. 3 (Synthesizing—sentence)					
$\bar{X}$	.44	.64	.36	.48	.60
Var.	.06	.07	.05	.03	.04
Var. 4 (Synthesizing—part sentence)					
$\bar{X}$	.77	.82	.80	.87	.87
Var.	.04	.05	.03	.01	.02
Var. 6 (Predicting—preceding phrase)					
$\bar{X}$	.07	.17	.16	.14	.10
Var.	.00	.05	.02	.01	.02

TABLE 6
MANOVA Pairwise Contrasts by Group
on Cluster 3 and Subvariables

Cluster 3	<i>df1</i>	<i>df2</i>	<i>F</i>	<i>p</i> <
Adult - Low 2	3	194	.85	NS
- Reg. 2	3	194	5.21	.001
- Low 4	3	194	7.89	.001
- Reg. 4	3	194	8.97	.001
Var. 2 (Hesitations)				
Adult - Low 2	1	196	.00	NS
- Reg. 2	1	196	7.69	.01
- Low 4	1	196	17.88	.001
- Reg. 4	1	196	22.94	.001

TABLE 7
Means and Variances by Groups on Cluster 3 Variables
for Which There Were Significant Differences

Cluster 3	Adult	Low 2	Reg. 2	Low 4	Reg. 4
Var. 2 (Hesitations)					
$\bar{X}$	.93	.92	.44	.18	.10
Var.	1.11	1.58	.27	.06	.02

TABLE 8
MANOVA Pairwise Contrasts by Group on
Cluster 4 and Subvariables

Cluster 4	<i>df1</i>	<i>df2</i>	<i>F</i>	<i>p</i> <
Adult - Low 2	6	191	6.78	.001
- Reg. 2	6	191	10.59	.001
- Low 4	6	191	2.75	.01
- Reg. 4	6	191	3.97	.001
Var. 1 (Miscues/words)				
Adult - Low 2	1	196	12.06	.001
- Reg. 2	1	196	45.49	.001
- Low 4	1	196	10.41	.001
- Reg. 4	1	196	21.58	.001
Var. 4 (Major meaning change)				
Adult - Low 2	1	196	10.97	.001
- Reg. 2	1	196	.02	NS
- Low 4	1	196	.09	NS
- Reg. 4	1	196	.00	NS
Var. 5 (Key words accessed)				
Adult - Low 2	1	196	3.67	.05
- Reg. 2	1	196	3.44	NS
- Low 4	1	196	3.01	NS
- Reg. 4	1	196	3.24	NS
Var. 6 (Key units recalled)				
Adult - Low 2	1	196	8.57	.01
- Reg. 2	1	196	20.57	.001
- Low 4	1	196	.55	NS
- Reg. 4	1	196	1.09	NS

miscues resulted in major meaning change. The adults were also able to correctly pronounce more words signifying key concepts than were the grade 2 readers. The adults also differed significantly from the grade 2 reader groups by recalling a greater number of key units. While the adults did not differ significantly from the grade 4 readers on the number of key units recalled, this does not mean that the adult illiterates were recalling as many units as were the grade 4 groups. What it does mean is that *relative to the number of passages read* (i.e., their instructional level), they were recalling as many key units as the older school age readers. The adult illiterates usually surpassed their reading instruction level on the second and third grade passages (similar to the low grade 2 and some regular grade 2 readers) while the regular grade 4 readers, for example, were reading passages quite comfortably up to the grade 6 level. In fact, a number of the regular grade 4 readers did not reach frustration level on the passages read.

The results of Tables 8 and 9 seem to indicate that unlike the low grade 2 readers (and in the case of key units recalled, the regular grade 2 readers), the adult illiterates were more sensitive to key concepts in a passage and to their potency for providing a recall. Thus the processing behavior of adult illiterates tended to result in more effective reading than that of the low grade 2 readers, and in the case of recalling key units, they were more effective than the regular grade 2 readers.

Conclusions and Discussion

Adult illiterates differed from regular and low reading achievers in grades 2 and 4 in terms of the nature of their processing: code dominant, meaning dominant, and control. These results also indicate the complexity of the reading process (Rigg & Kazemek, 1983), for within each cluster there were varying differences on specific processes for various groups. For example, whereas the adults did not differ from the low grade 2 readers in the use of inappropriate syntactic cues when synthesizing, they were more successful than these readers in synthesizing when appropriate syntactic cues were available; the opposite result occurred for the comparison between the adults and the regular grade 2 readers. Thus the processing of adult illiterates or any group of readers cannot be described in terms of a single process behavior such as a developmental lag in phonemic processes (Beech & Harding, 1984). In fact, the use of graphophonic information, at both a letter and syllable level, did not differ significantly across the groups studied in this research.

In terms of differences on specific processes, the adult illiterates differed least often from the grade 2 readers (four differences for low two and three for regular two) and most often from the grade 4 readers (six differences for low grade 4 and 7 for regular grade 4). Thus while these adults had spent an average of nine years in school (information obtained from them), the nature of their reading processing behavior was similar to that of readers who have spent less than two years in school.

However, the processing behavior of adult illiterates tended to result in more effective reading behavior than the grade 2 readers, especially in the recall of key units. This may be understood in terms of the interactive nature of the reading process (Stanovich, 1980) and the presence of appropriate and elaborate knowledge schemas with which to construct a meaning for the text (Kazemek, 1983). The adults possessed a greater degree of knowledge about the various animals that constituted the topics of the passages. They frequently made comments and related personal experiences as they attempted to construct meaning. An example to show the interaction of one process (monitoring) with this prior knowledge was provided by one adult as he attempted a pronunciation for the word "built" in a sentence. "They built her a house in a tree." The adult made repeated attempts at "byool," "bile," "boo-il" (note inattention

TABLE 9
Means and Variances by Groups on Cluster 4 Variables
for Which There Were Significant Differences

Cluster 4	Adult	Low 2	Reg. 2	Low 4	Reg. 4
Var. 1 (Miscues/words)					
$\bar{X}$	.07	.05	.03	.04	.04
Var.	.00	.00	.00	.00	.00
Var. 4 (Major meaning change)					
$\bar{X}$	.07	.17	.07	.06	.07
Var.	.00	.04	.00	.00	.00
Var. 5 (Key words accessed)					
$\bar{X}$	.97	.96	.99	.99	.99
Var.	.00	.00	.00	.00	.00
Var. 6 (Key units recalled)					
$\bar{X}$	.47	.35	.28	.44	.50
Var.	.03	.03	.03	.02	.03

to final letter cues), and then said “It has something to do with a house—paint—no it can’t be paint, the first letter doesn’t match—buy—no, made—oh, built.” In contrast, a low grade 2 reader read a sentence “Bob was able to help him” as “Bob was ablo to help him” and in the recall stated that “Bob was ablo.” The adults’ processing coupled with other cognitive resources such as prior knowledge allowed them to correctly pronounce most of the key words and to retrieve over four out of 10 of the key units in a free recall situation. One may surmise that if the passages were based on such topics as unemployment or abortion, the adults would have an even greater advantage than the school age readers in attempting to construct meaning.

The reading processing behavior of low achieving adult illiterates is relatively similar to the processing behavior of readers who have spent two years in school. However, the adult illiterates were generally more successful in constructing and recalling meaning from the text. Thus, while programs for low achieving adult illiterates may incorporate methods to engage the adults in cognitive processes similar to those of young school readers, these programs must also take into account other resources of adults such as the presence of more elaborate prior knowledge schemas.

TABLE 10
Behavioral Indicators of Cognitive Processes and Relating Effectiveness

A chart was made of all uncorrected miscues, corrected miscues, repetitions of words or word parts, and hesitations (three-second delay or greater). The operational criteria for the various processes were as follows:

Table 10 continued

Cluster 1

1. 2. 3. Attending to text: for substitution miscues with one-half or more graphemes in common, a code of 2 was assigned; less than one-half but at least 1, a code of 1; and no graphemes in common, a code of 0. Additions and omissions were coded as 0. A code of 2 was considered indicative of high attending, a code of 1 as moderate attending, and a code of 0 as low attending. Each total was divided by the number of miscues.
4. Attending to words: this was a ratio of the number of graphemes in common between text words and miscue substitutions.
5. 6. 7. Analyzing-position: the ratio of cues accessed from the beginning, middle, and end of words when a response is substituted, to the total number of substitutions.
8. Analyzing-sequencing: the ratio of substituted responses to the corresponding text words in which two or more contiguous letters were accessed in the same sequence.
9. Symbol-sound associating (graphemes): the ratio of phonemes in substituted responses to common phonemes in text words.
10. Symbol-sound associating (syllables): the ratio of correctly pronounced syllables in substituted responses to common syllables in text words.

Cluster 2

1. Meaning associating: the ratio of real word responses to the number of substitution and insertion miscues.
2. Synthesizing-sentence (syntactic, nonsyntactic): the ratio of miscues that within a sentence were semantically acceptable, to the total number of miscues.
3. Synthesizing-sentence (semantic-syntactic): the ratio of miscues that within a sentence were semantically and syntactically acceptable, to the total number of miscues.
4. Synthesizing-part sentence (semantic-syntactic): the ratio of miscues that within part of a sentence (phrase) were semantically and syntactically acceptable, to the total number of miscues.
5. Predicting-sentence: the ratio of miscues that were semantically consistent with the meaning of the previous sentence, to total number of miscues.
6. Predicting phrase: the ratio of miscues to the total number of miscues that were semantically and syntactically consistent with the meaning of the preceding phrase only.

Cluster 3

1. Monitoring (corrected miscues): the ratio of the number of miscues that were corrected to the total number of miscues.
2. Monitoring (hesitations): the ratio of the number of hesitations to total number of miscues.
3. Monitoring (repetitions): the ratio of the number of repetitions to total number of miscues.

Cluster 4

1. Miscues: the ratio of miscues to the number of words in the text.
2. Major meaning change: the ratio of miscues which changed the meaning of the key concepts to the total number of miscues.
3. Minor meaning change: the ratio of miscues which changed the meaning of a text word other than a key concept, to the total number of miscues.
4. No meaning change: the ratio of miscues that did not change the meaning of a text word, that is, they were synonymous with the text meaning.
5. Key words* correctly pronounced: the ratio of number of key words (representing key concepts) correctly pronounced, to the total number of key words.
6. Key units** retrieved: the ratio of the number of key units retrieved, to the total number of key units.

*Key words (concepts) were identified by two independent raters (91.1% agreement) by selecting the approximate one-third most important concepts in each text. The clauses containing these concepts were then considered the key units.**

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Redressing the Negative Influence of Socioeconomic Status Gender in a Treatment Facility School

The potential of a remedial education program to redress the academic failure students experienced in community schools prior to entering a treatment facility was examined. Test scores in five skill areas for 20 clients with an average age of 13.3 years and of mixed gender and socioeconomic status (SES) were compared upon entering and exiting from the program. All subjects in the study made significant gains in each skill area tested. Results indicated that remedial education in conjunction with a treatment program was effective in overcoming the influence of SES and gender on achievement.

Numerous studies have addressed the effect of socioeconomic status (SES) and gender on academic achievement. Coleman (1966) emphasized the importance of family background and argued that the most powerful predictor of school performance is socioeconomic status. Calliste (1982) contended that the higher SES students were likely to have higher academic achievement, a better self-concept, and different employment aspirations. Initial impressions which influenced all subsequent interactions (the halo effect) emphasized by manners, dress, language used, and deportment were all strong characteristics favoring students of higher SES. Rist (1970) noted that schools were not willing to diagnose the same negative behavioral traits in high status students as they were for lower status students.

Similarly, gender studies have suggested a positive relationship exists between teacher evaluations which favor females over males. Prawat and Jarvis (1980) found that female high school students were given higher evaluations than were males by the same teachers. A study involving ethnic groups in public schools showed that female preference was a factor in assessing academic achievement (Clifton, 1981-1982). Studies addressing gender behavioral characteristics revealed that females received more teacher interaction as they were viewed in less threatening terms. Males, on the other hand, received more discriminatory interactions due to their propensity for overt aggressive behavior (Kedar-Voivodas, & Tannenbaum, 1979). These authors believed that aggressive tendencies on the part of males was the most unequivocal sex

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difference in the literature. These findings were like those of Brophy and Good (1970) who observed that discrimination against males was not so much a sexist reaction on the part of teachers, but was a reaction against the breaking of classroom rules by boys.

The professional literature also indicates that teacher assessments of students based on second-hand information obtained from reports, school reports, and psychological assessments can be negative if past histories indicate poor performance (Rist, 1973), or positive if they are described in terms of high achievement. High achievers experienced more quality interactions than those students considered to be poor achievers (Prawat & Jarvis, 1980).

This study examined the ability of a remedial education program within the context of a treatment facility to redress such negative aspects of SES and gender on academic achievement experienced by each client in the community school system. The subjects were a specialized population which had been academically and intellectually assessed by school board personnel, and had all been designated as underachievers functioning below expected grade level. The group included upper SES females and lower SES males and females. The upper range females exhibited the negative effects of failure to live up to the higher expectations placed upon them as upper SES females. The lower SES group brought with them the most severe negative aspects of SES interactions since they were part of the lower strata of an already deprived group. Thus the population of the study possessed most of the negative characteristics outlined in the SES and gender literature. The focus of this project was to determine if such a group could achieve academic success in a treatment environment in spite of their past negative school experience.

Method

The way in which the project was designed and undertaken is described below.

Subjects

The subjects consisted of 20 clients: 11 females ranging in age from 11.2 years of age to 16.1 years (average 13.7 years) and nine males ranging in age from 10.2 years of age to 15.4 years (average 12.8 years). The average length of time spent in the program was 10.4 months. All of the clients were involved in a treatment program at Thistletown Regional Centre for Children and Adolescents, Toronto, during the years 1981-1982, and all attended an on-site school as part of their therapeutic program. The subjects exhibited some or all of the following behavioral characteristics: verbal/physical aggression against peers and/or adults, delinquency, suicidal gestures, deviant behavior at home/school/community, truancy, and school failure. All had been involved with a variety of social, legal, and educational authorities prior to admission to the treatment program.

Each client or subject was required to attend school daily and was placed in a class with up to four other peers of either gender, and received instruction from one teacher. Individual programming was the mode of instruction. If the class consisted of unusually aggressive students, a teacher's aide was assigned. All of the academic subjects were taken in the same classroom with the assigned teacher. Students moved to other locations for instruction in woodworking, art, and physical education on an average of two times a week.

Testing

Each subject was retested by a diagnostician upon entering the program in order to ascertain functioning levels for reading comprehension, mathematics, language, oral reading, and spelling. The purpose of the testing was to identify a performance level for each client in each of the skill areas so that a remedial plan could be developed by the diagnostician in conjunction with the classroom teacher. The remedial education plan was incorporated into the treatment goals, and was addressed at each review conference held every six weeks. Ongoing informal evaluation was conducted by the teacher in order to determine each client's progress. On discharge from the program, the student was retested by the diagnostician in order to determine the degree of academic progress in each of the skill areas. Due both to the length of time between the two formal testing procedures and the fact that a different form of the Metropolitan Achievement Test was used, the practice factor was not deemed to have inflated the scores. Since the anxiety level of clients increased as discharge time approached, the final scores may have been slightly depressed.

Instruments

The Metropolitan Achievement Test was used to determine pre- and postgrade level scores for reading comprehension, mathematics, and language. Another measure of reading achievement was obtained using the Slosson Oral Reading Test. Spelling performance was assessed by the Morrisson McCall Spelling Scales. The Blishen socioeconomic index (Blishen & McRoberts, 1976), was used to determine the socioeconomic prestige ranking for the working parent of each client.

Procedure

The subjects were divided into five different groups for comparative purposes: all males and all females; upper range SES clients and lower range SES clients; upper range females; lower range females; and lower range males. There were no upper range males available for the study. The distinction between upper and lower range SES groups was determined by adopting the median point between the highest and the lowest rating of the working parental figure who had the higher index rating according to the Blishen scale.

An SES package was used to generate comparison tables for the progress of each client using the differences between pretest and posttest scores for reading comprehension (RC), mathematics (M), language (L), oral reading (OR), and spelling (S). T-tests were used to evaluate the degree of progress made by each student in each of the skill areas and Anova tables compared the groups on the basis of gender and SES in order to determine if significant differences were obtained by comparing one group with another.

Results

The correlated *t*-test results indicated that all of the students in the study made significant gains in each of the skill areas tested. All of the *t*-tests' values were significant at the .01 level. When all males were compared to all females in terms of achievement, female students made significant gains in mathematics ($t=2.70$, $p<.0223$) and in reading comprehension ($t=2.70$, $p<.0223$), and less significant gains in spelling, oral reading, and language (see Figure 1). Males made significant gains in reading comprehension ($t=5.41$, $p<.006$) and oral reading ($t=3.34$, $p<.0132$), and less significant gains in language and mathematics (see Figure 2).

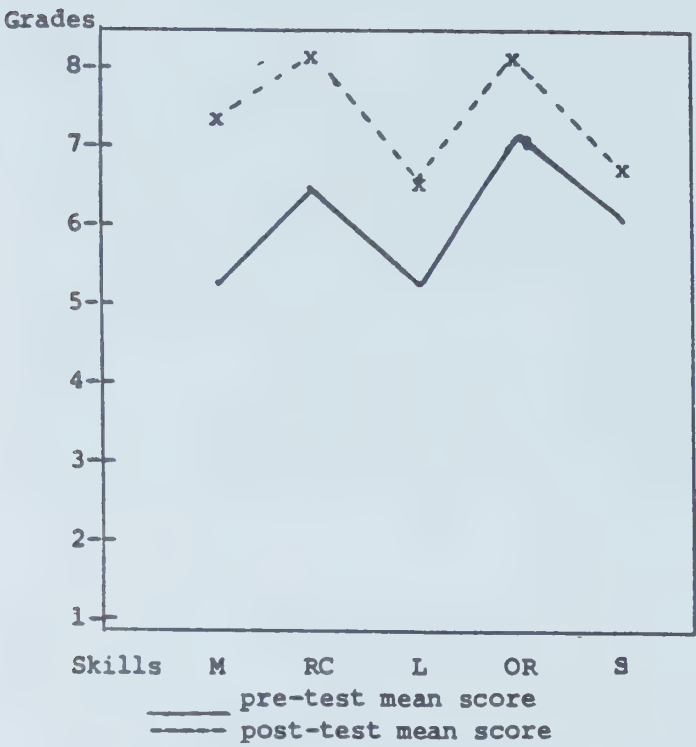


Figure 1: Females: (N-11), Pre- and Posttest Scores Comparisons

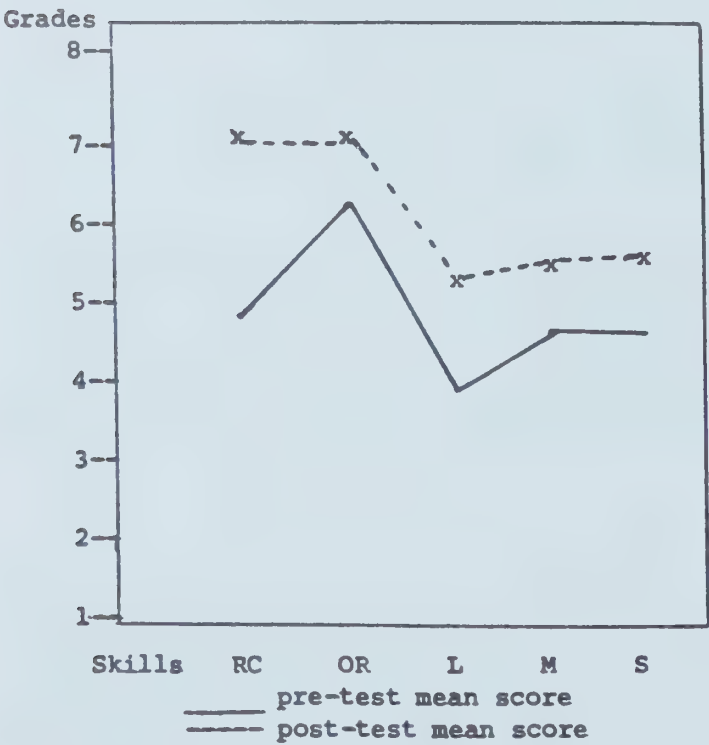


Figure 2: Males: (N-9), Pre- and Posttest Scores Comparisons

The SES results reveal that the lower group made significant gains in reading comprehension ($t=4.17$, $p<.0008$), oral reading ($t=4$, $p<.0016$), and spelling ($t=3.35$, $p<.0074$, see Figure 3). The upper SES students made significant gains in mathematics ($t=2.99$, $p<.0203$) and moderate gains in all other areas with the exception of oral reading (see Figure 4).

Group comparisons on the basis of performance for SES and gender suggest that although the lower range of females improved in their performance, there was no significant difference between their performance and the upper range SES group. When the results achieved by all males were compared with all females, the latter scored higher in mathematics ($F(2.17)=7.08$, $p<.0165$).

Discussion

The results of this study suggest that SES and gender were not influential factors affecting academic performance of clients in a treatment facility school. This is a marked departure from research findings that show SES and gender as variables affecting academic achievement in the community school system. Whereas much of the literature suggests that higher SES students receive higher grades than lower SES students, the findings from this investigation reveal that in a specialized setting the upper SES group did not receive a more positive evaluation than the lower SES students as there was no significant difference between the scores of the two groups. Similarly, the view that underachieving students whose school records present a history of negative behavior receive little positive teacher interaction, appears to be contradicted by the finding that lower range SES clients improved in more of the skill areas than did the upper range SES group. Likewise, the claims that males experience more discriminatory interactions and achieve fewer academic gains than females and that males resort more frequently to aggressive and rule-breaking conduct than females and thereby are subjected to negative teacher discrimination, are challenged by the lack of difference in the achievement of females and males observed in this study.

The findings and context of this investigation tend to support Brophy's (1983) assertion that teachers can relate well to students given an accurate initial assessment of their potential and when the learners are open to "corrective feedback." Teachers in the facility environment approached their task with fewer expectations of their students to perform; thus the emphasis upon their immediate learning needs may have helped to overcome the effects of SES and gender. The smaller classes provided a less stressful environment, along with greater individual attention thereby building student confidence and facilitating more immediate feedback on performance.

There are a number of other factors which may explain why the effects of gender and SES were less apparent in this study. The teachers and clinicians in the project tended to be more empathetic toward the students because of their awareness of the effect negative gender and SES attitudes had on clients when they were attending community schools. This desire to improve the students' negative self-images became an important ingredient of the treatment plan. It was reflected in the collaboration approach of teacher and clinician in support of the goals of both education and treatment. In many cases, educational demands placed upon the students were initially subordinated to treatment needs, and the client was introduced to educational expectations on a gradual basis which proved to be less stressful than those previously experienced in the community school system. When educational demands were made, it was in a small supportive classroom setting where expectations for performance were less threatening and less competitive.

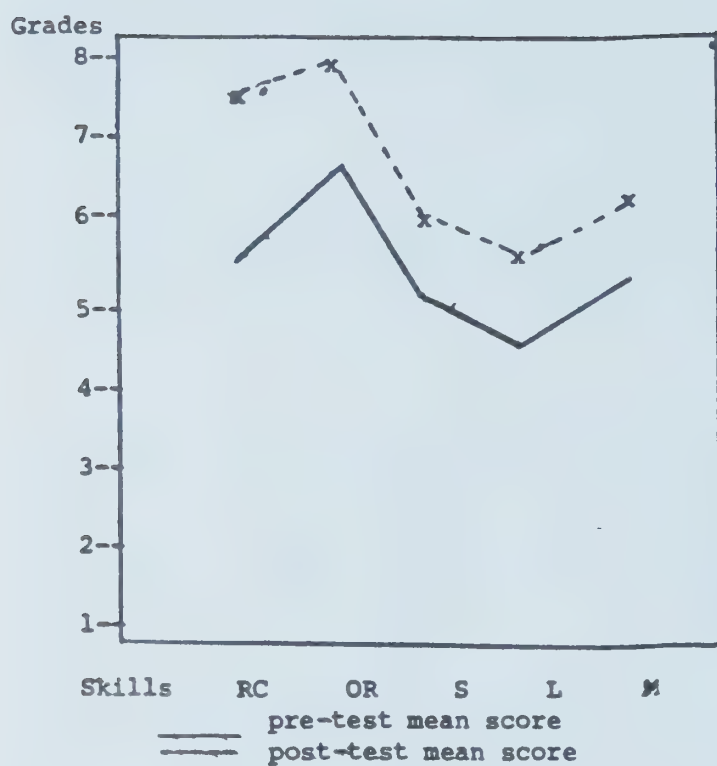


Figure 3: Lower Range SES, (N-14)

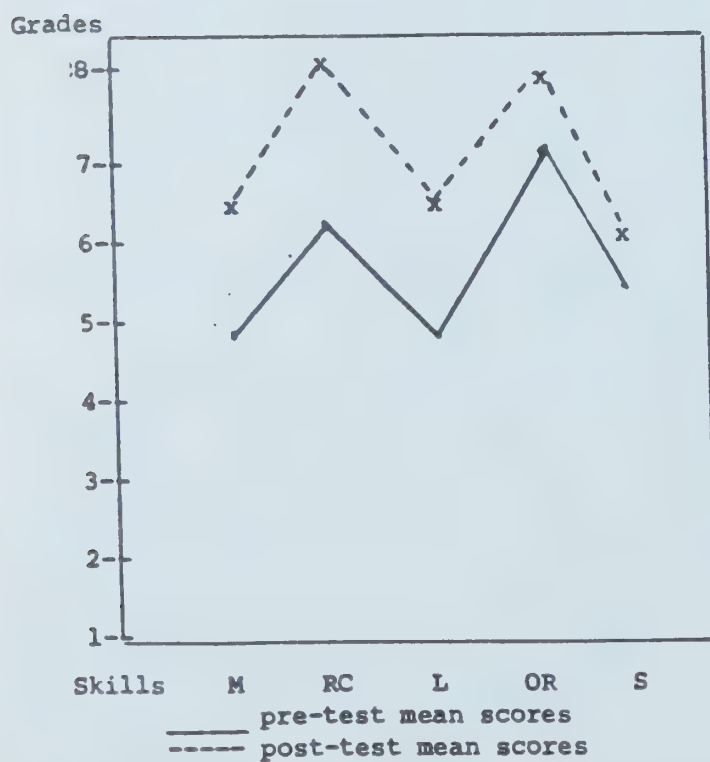


Figure 4: Upper Range SES, (N-7)

Another influential factor was the low teacher-pupil ratio which allowed for individual instruction. This enabled the teacher to address more effectively the goals of the educational plan. The fact that progress towards these goals was reviewed every six weeks reinforced their motivation. The treatment setting also afforded more control over the educational process. When students were removed from the classroom back to the residence because of unacceptable behavior, their work was still required to be completed. Thus gaps in instruction and learning were minimized, and failure to follow through could result in sanctions being imposed on the client until the assignments were completed.

The outcomes of this study of the Thistle town Project indicate that it is possible to redress or overcome the negative influence of SES and gender on student achievement. The extent to which the gains observed will be sustained, diminished, or promoted in other learning environments remains to be investigated.

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BOOK REVIEW

THE INCOMPETENT TEACHER, *By Edwin M. Bridges*. Philadelphia, PA: Falmer, Taylor and Francis, 1986, 191 pp.

This book will interest administrators, school board members, teachers, and others responsible for dealing with incompetent teachers. It describes the successes and failures of administrators who attempt to eliminate poor teachers from the classroom. It also presents a plan that might eventually rid the teaching profession of its undesirable members.

I found this book to be a pleasure to read. Bridges makes good on his promise to write a book that is informative, interesting, easy to read, lacking in technical jargon, and without complicated statistical analyses. An average reader should have little difficulty in completing the reading of this publication in two evenings. Each of the six chapters is nicely summarized for the reader who is pressed for time or is interested in reviewing only key findings.

Aside from an extensive review of the literature, the data used by Bridges to compose this book were acquired from interviews with administrators and from questionnaires received from administrators of randomly selected school districts. A third source of information was a case study of a small district which was considered successful in dealing with teacher incompetence. Since all data were collected in the state of California, some might argue that the findings in this book are not applicable to other regions. It is difficult to take this criticism too seriously because teacher incompetence is known to transcend political boundaries, and, also, the legislation which protects tenured teachers is quite uniform across North America.

The author estimates that roughly five percent of teachers are incompetent. He found that the term "incompetence" lacks precise technical meaning and neither legislatures nor courts of law have provided guidelines that assist administrators in determining poor teaching performance. When asked to give their opinions, administrators stated that incompetent teachers usually failed to: maintain discipline, treat students properly, impart subject matter effectively, accept teaching advice from superiors, master subject matter, and produce the intended or desired results in the classroom. The research conducted by Bridges revealed that administrators did not often deal effectively with teachers evidencing these behaviors.

The second chapter describes how and why poor teachers are tolerated and protected. It comes as little consolation to learn that doctors, lawyers, and members of other professions are equally skillful at covering up for their inept colleagues. Three reasons are given for why administrators are reluctant to confront incompetent teachers. First, they are aware that the employment rights of tenured teachers are protected by legislation and the burden of proof as to whether a teacher is incompetent rests with the school district. A teacher possessing a permanent contract enjoys a property right to that position and is entitled to due process of the law if termination is being considered. The considerable expense associated with documenting a case

against an incompetent teacher, coupled with the possibility that a school district may lose the judgment, causes some administrators to overlook poor performers.

The ambiguous nature of teacher evaluation is cited as a second reason why administrators do not purge incompetents from school classrooms. There are no clear-cut standards to guide administrators in determining teaching incompetence.

Third, administrators often choose to avoid the discomfort and unpleasantness which accompanies the dismissal of an incompetent teacher. In place of direct action, the administrator may use a roundabout approach such as assigning the teacher to a less than desirable working environment.

Ineffective administrative practices are seen as contributing to the professional longevity of incompetent teachers. When some administrators make their infrequent classroom visits, the occasions are used to offer ceremonial congratulations. Seldom do these administrators address the improvement of instruction. Teachers are often provided with inflated ratings and their reports contain double talk in that positive statements are used to describe poor performance.

Several factors are identified which force administrators to deal with incompetent teachers. Parental complaints about teachers, when numerous and in writing, often spur administrators into action. Most complaints about teachers originate with middle-class parents. Lower-class parents seldom voice their concerns, while disenchanted wealthy parents generally transfer their children to private schools. Teacher layoffs due to declining enrollments or fiscal cutbacks sometimes induce administrators to use teaching performance rather than seniority as a basis for eliminating positions. Public concern is often voiced when young capable teachers are laid off and long-term, incompetent teachers are retained. Smaller districts with limited finances are more likely to use performance than seniority as the basis for layoffs. Larger and more affluent districts tend to accommodate staff cutbacks through attrition and frequently hide their incompetent teachers through transfers to positions which are less likely to draw the ire of parents. In those districts where teacher evaluation is taken seriously, administrators are inclined to take action against incompetent teachers.

When a lion-hearted administrator decides to confront an incompetent teacher, a series of events generally follows. Chapter 3 summarizes the salvage attempts used by administrators to rehabilitate poor teachers. Initially, an administrator provides a teacher with a detailed description of what is happening in the classroom. In a written report the evaluator is often critical of the teacher's performance. The report also specifies what the teacher must do to become competent. Expected tasks and behaviors are spelled out and a lesson-planning model is frequently used to direct the teacher. Upon receiving the report, the teacher often rejects the criticism, becomes defensive and antagonistic, and may even launch a counterattack against the administrator. The poor performer is offered opportunities to improve by observing exceptional teachers, attending inservice sessions, and conferring with consultants. Because of the possibility of future legal action against the teacher, the administrator seldom offers any form of positive reinforcement which might weaken the district's case at a dismissal hearing. Although the evaluation reports are written for the benefit of the teacher, they are also intended to satisfy the adjudicator who might later uphold or deny the teacher's dismissal.

Bridges' research revealed that most attempts to salvage incompetent teachers fail. This prophecy could be self-fulfilling considering the lack of praise or encouragement offered by administrators to teachers during evaluations. But even staff development specialists who spend considerable time and effort in working with poor teachers report that they are disillusioned by their attempts to remake substandard

teachers. The findings in this book are gloomy in that the performance level of most poor teachers seldom improves to an acceptable level in spite of the remedial programs that are offered. This leads one to believe that providing assistance to incompetent teachers is a waste of valuable resources and is merely posturing while the administrator builds a case for dismissing the poor performer.

The dismissal of incompetent teachers is one option which is available to administrators, but it is not uncommon for an administrator to consider other ways of removing poor teachers. Administrators often exert pressure on marginal teachers to resign or retire early. Through indirect means, an administrator may change a teacher's working conditions, such that it becomes undesirable for that person to remain in teaching. If methods are used, the administrator may issue negative evaluations, use threats and intimidation, place the teacher on a remediation program, or serve notice of intent to dismiss.

Most induced exits entail negotiations between the teacher who is under fire and an administrator. The approach taken by the administrator in the negotiations appears to depend on his or her personality. Some administrators attempt to address the needs of the teacher and uphold his or her dignity, while other administrators are hardliners who employ intimidation tactics. Most teachers receive some type of inducement to resign but their settlements are usually less than the long-term savings realized by the district.

Bridges found that teachers' unions play a unique role in the dismissal of incompetent teachers. Although unions owe their members the right to fair representation and often provide this service, their officers do not render the same level of service to everyone. In cases where documentation revealed the teacher to be clearly incompetent, the union cooperated with administrators in counseling, advising, or persuading the teacher to resign.

A case study is presented to illustrate that a school district can systematically rid itself of poor teachers. The district under study had three elementary and junior high schools and served an isolated, suburban community which was relatively affluent. The drama unfolded when a number of younger but popular teachers were threatened with dismissal due to staff cutbacks. A citizens' committee pressured the superintendent and school board into using teaching performance rather than seniority as a basis for reducing staff. In response to this pressure, and after receiving a considerable donation of money from the private sector, the superintendent and school board initiated a plan to improve teaching performance and remove incompetent teachers.

The evaluation of teachers in this district was performed by principals and was based on management by objectives. Administrators spent considerable time observing teachers in their classrooms and surveying students and parents. When teaching deficiencies were identified, teachers were provided with additional supplies, equipment, advice, and development opportunities to help them improve. Those teachers who did not measure up to the standards set by the district were advised to resign or take early retirement. Consulting firms were employed to counsel teachers into alternate careers and to prepare principals for the emotional confrontations associated with teacher dismissals.

The plan used by this district to deal with incompetent teachers appears to have worked quite well. After four years of implementation, the district had cut nine teaching positions and the teachers who left were the weakest. The union proved helpful to the administration by not filing any grievances.

The author concludes his book by reviewing present practices of recruiting, developing, and evaluating teachers. He is critical of the status quo because insufficient

attention is given to promoting effective teaching. The undesirable by-product of present practice is an assured supply of gainfully employed incompetent teachers. In musing about what might occur in the future, the author proposes a course of action that may reduce the number of poor teachers occupying the nation's classrooms. The attainment of his objective is linked almost exclusively to the recruitment of promising graduates from teacher education programs and the subsequent development of these teachers in their pretenure years. For reasons which are not immediately apparent, Bridges chooses to ignore the continued professional development of the tenured teacher.

The selection procedures proposed by Bridges for recruiting teachers are rigorous and based on performance criteria. Once hired, probationary teachers face tough tenure provisions. To achieve the high standards set by districts, new teachers are provided on a voluntary basis with extensive assistance to help them develop. To use the author's words, the system of evaluation is "hard on the standards but soft on the people." He predicts that in spite of rather stringent recruitment practices, only a minority of probationary teachers will be granted tenure. This forecast is disturbing when one considers the human and fiscal costs associated with training and developing beginning teachers. One might argue that the author's pessimistic prediction is alterable and that the ratio of probationary teachers gaining tenure can be increased significantly if beginning teachers are required to participate in developmental activities. The voluntary system of professional development which is advocated by Bridges, although democratic, may weaken the probationary teacher's chances of success. How many other professions use a similar hit-and-miss approach?

This book is well written, informative, and does a superb job of describing how administrators deal with incompetent teachers. In designing a future that is devoid of teacher incompetence, the author provides some useful ideas for selecting teachers and planning for their development. His proposal is incomplete in that it fails to mention how school districts can deal effectively with tenured teachers whose competence is on a downhill slide. Perhaps this shortcoming will be addressed in a later publication. Reading this book is a must for administrators, school board members, teachers, and others who wish to address seriously the problem of teacher incompetence.

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